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Agricultural Flying Seen As Major Aviation Activity

"Agricultural flying is one of the biggest potential aviation activities in sight today," declared Charles F. Horne, Administrator of Civil Aeronautics, in an address last month before the 6th Annual National Flying Farmers' Convention at Fort Worth, Texas.

"Recent history," he said, "gives us every reason to expect a healthy growth for this branch of aviation; a growth likely to be punctuated by sudden and remarkable advances based upon new developments in the three fields of chemicals, agriculture and aviation."

"Right after the war," continued the Administrator, "we had the new discovery of 2, 4-D to help stimulate a very sizable increase in the number of planes used in agriculture. That one development—plus such factors as availability of surplus aircraft and ex-military pilots, and an unprecedented crop need—built up our fleet of agricultural planes to a 5,000 total for last year. It caused a sudden spurt in the business, and I am convinced that other discoveries, or developments will cause similar increases in the future."

Development of Chemicals.—Mr. Horne discussed the tremendous possibilities for development in the chemical field and used findings of the Department of Agriculture to support his point.

"Robert M. Salter, of the U. S. Department of Agriculture, recently pointed out that we are fond of believing that our agriculture has gone about as far as it can go, especially with regard to our efficiency and capacity to produce crops" he said. "Then he proceeds to describe an amazing list of new things in agriculture, connected with the use of chemicals."

"These new methods are important to us in the aviation industry, because of the variety of jobs which can be done only by the airplane. Take the use of 2, 4, 5-T on the cattle ranges to kill mesquite, and the use of 2, 4-D to kill sagebrush, an operation completely impractical to perform except with the airplane. Mr. Salter describes experiments in Oklahoma in which the beef yield per acre has been increased two to four times through chemical killing of sagebrush and pasture reseeding by airplane. An Agricultural Department office estimates that 1,000,000 acres of range land in Texas alone will be so treated in 1951. Add to this all the other millions of acres of range land throughout the country, yes, even the world, that can be cleared of non-productive shrubs and weeds, and you can begin to imagine a part of the future of agricultural aviation."

"Still another great possibility is opening," the Administrator said. "Scientists of the U. S. Department of Agriculture, and State agriculture departments, are experimenting with the use of weed-killing chemicals on ground which has been prepared and into which the crop seeds have been placed. As the inevitable weed plants emerge, they are killed without further work or effort. Here we have the ounce of prevention at work. In the great sugar beet fields, even in the great grain fields, this kind of weed-killing presents tremendous possibilities."

Labor Costs Reduced.—The Administrator pointed out that the airplane will have an increasing effect upon labor costs in the raising of many crops, and cited as an example, the spraying of cotton fields with weed killer, which resulted in a reduction of hoeing costs from about \$14 an acre to about \$6.50.

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Stall Recovery Demonstrations Pay Dividends

The Civil Aeronautics Administration's program of re-education in recovery from stalls seems to be paying dividends in saving lives.

Preliminary reports from regions where the stall recovery program has been conducted show a reduction in stall-spin accidents. In the regions where this education and accident prevention program has not been conducted, stall-spin accidents have shown an increase.

With statistics showing that approximately half of the fatal accidents in non-air-carrier flying over a period of 2 years were caused by stall-spins, the CAA last year sent out a specially-equipped plane to tour the country demonstrating improved stall-recovery techniques. Special features of the test plane include a helicopter-type air speed indicator, and very sensitive altimeter and angle of attack indicators, which makes it possible for pilots to learn how to recover from stalls with a minimum loss of altitude.

So far, four of the CAA continental regions have been visited and hundreds of demonstration flights given.

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Farming Plane Lauded on Test Tour

The AG-1, first airplane designed especially for agricultural flying, has successfully completed a 7-week service test-demonstration tour of the South and Midwest, according to reports of CAA Regional Administrators.

In the Southwest alone, the airplane performed in 24 centers of agricultural aviation activity, and was flown by 147 different pilots. By adhering to a rigid schedule during this 4,180-mile portion of the tour, every appointment was kept on time.

In line with the purpose of the trip, a few minor structural "bugs" were discovered and corrected, but none were of a nature to tie up the plane. Pilots who flew the aircraft were enthusiastic, particularly over its handling characteristics.

Similar test-demonstrations now are being conducted in CAA's Northwestern Region, after which

it will go to CAA Region Six, headquartered at Los Angeles.

At the conclusion of this period of service-testing, the plane will be returned for final modifications to Texas A. & M. College, where it was built under CAA contract.

The development of this airplane was jointly sponsored by CAA, the U.S. Department of Agriculture, and the National Flying Farmers Association, with contributions of equipment and services from Aeronca Aircraft Corp., Aircraft Conversion Co., American Seating Co., Beech Aircraft Corp., Cessna Aircraft Corp., Continental Motors Corp., Cornell University Medical College, Goodyear Tire & Rubber Co., Koppers Co., McCauley Propeller Co., Safe Flight Instrument Co., U.S. Rubber Co., and Vic Pastushin Industries, Inc.

Pan American Division Subject of Board Order Concerning Mail Rates

The Civil Aeronautics Board announced last month that it had issued a show cause order proposing final mail rates for Pan American World Airways' Pacific Division for the 5-year period from November 16, 1945 through December 31, 1950. However, the Board pointed out that under the temporary rate in effect during the subject period, Pan American had actually received approximately \$55,258,000, which consequently will necessitate a refund to the Government by Pan American of \$5,788,000 for operations of its Pacific Division.

In proposing the final mail rate for Pan American's Pacific Division, the Board said that it had concluded as a matter of policy that profits from military contract services—such as the Korean Airlift—in excess of the amount required to provide a reasonable return to the carrier, after provision for Federal income taxes on the investment devoted to such services, are "other revenue" and should be taken into account in mail rate determinations where the carrier is on a subsidy rate. The Board said that it must be borne in mind that a major purpose of so-called "need" mail pay has been the development of a civil air arm which may be used in a national emergency.

In the Board's view, exclusion of the current revenues, such as from the Korean Airlift, would be tantamount to disregarding that purpose and to underwriting with mail pay for no purpose a "need" which simply does not exist. Thus the Board reduced Pan American's break-even need for the Pacific Division operations during the 5 year review period by \$1,233,000, which represents airlift profits in excess of a 7 percent return before taxes. The net reduction in the break-even requirement after provision for Federal income taxes, which is applicable to the airlift operation, is \$991,000, the Board said.

The Board said that the fact that Pan American has received an over-payment for its Pacific operations under the temporary rates is not indicative of an over-payment for its four divisions in the aggregate for the period in question (1945-50) since final mail rates have not as yet been determined for Pan American's other three operating divisions for a number of years within the period under review.

Havana-New York Run Granted to Cuban Airline

In an action approved by the President, the Civil Aeronautics Board recently granted a temporary air carrier permit to Compania Cubana de Aviacion, S. A. authorizing air transportation of persons, property and mail between the terminal points Havana, Cuba, and New York, N. Y. The permit will be limited to a 3-year period, in accordance with the Board's usual practice in cases where a permit is granted for a new route without the existence of a bilateral agreement.

Among the restrictions imposed by the Board on the award of the temporary permit to Cubana was the provision that Cubana shall not, in its advertising (including the insignia on its aircraft) or its public relations, publicity, scheduling, or otherwise, disclose any relationship (other than the general agency relationship) existing between it and Pan American. The Board also required that neither Cubana nor Pan American shall act as agent for nor employ the other for the sale of tickets, the acceptance and delivery of air cargo shipments, the solicitation of traffic or the furnishing of ticket office and reservation facilities. It is not the Board's intention, however, by this condition, to prevent either Cubana or Pan American from issuing interline tickets or waybills for

Final Mail Rates Fixed For Big Four Carriers

The Civil Aeronautics Board last month announced an opinion proposing final mail rates for the Big Four air carriers, American Airlines, Inc., Eastern Air Lines, Inc., Trans World Airlines, Inc., and United Air Lines, Inc., which will result in these four carriers repaying the Government nearly five million dollars.

Each of the four carriers has been receiving mail compensation on a temporary basis pending final determination of their mail payments by the Board. As a result of the proposed final mail rates for the periods up to January 1, 1951, the carriers have been overpaid as a group in the total amount of \$3,430,000. In addition, for the quarter ended March 31, 1951, the excess of the temporary payments to the group over those due under the 45-cent rate approximates \$1,529,000. The amount of \$4,959,000, representing the aggregate over-payment to the four carriers through the first quarter of the year 1951, will be due and owing to the Government upon finalization of the mail rates proposed in the Board's opinion.

This opinion and the accompanying order proposes mail compensation equal to 63 cents per mail ton mile for periods commencing in 1947 in the case of three of the carriers, and in 1948 in the case of the fourth carrier, to and including December 31, 1950.

For the period on and after January 1, 1951, the Board proposed a uniform rate of 45 cents per mail ton mile for the four carriers. This rate is found by the Board to be a compensatory or "service" rate free of any subsidy to the carriers from the Government.

The Board's action followed after the conclusion of conferences with the various parties, culminating in agreement upon the rates proposed in the opinion. The fact that agreement was reached obviated the necessity for lengthy hearings which had started in June of this year and which would otherwise have continued for a protracted period.

Commercial Pilot Ratings Increase

Commercial pilot and airline transport pilot approvals showed a slight gain for the first six months of 1951 over the corresponding 1950 period. Instrument rating approvals and control tower operator approvals also showed increases. Student and private pilot approvals continued to decline.

Below are comparative figures for the January-June periods:

Category	January-June	
	1951	1950
Student pilots.....	19,904	22,157
Private pilots.....	10,143	12,060
Commercial pilots.....	2,782	2,538
Airline transport pilots.....	570	385
Instrument ratings.....	1,207	593
Mechanics (original).....	2,324	3,522
Parachute technicians.....	78	81
Control tower operators.....	537	402
Ground instructors (original).....	274	676

transportation involving carriage on the aircraft of both parties.

The Board said that the conditions it is imposing with respect to the Pan American-Cubana relationship, and with respect to ticketing and sales agency activity, are novel. The Board added, however, that it is compelled to impose them by reason of the particular competitive conditions existing in this situation. In passing on any applications in the future, in which similar competitive conditions are involved, it is the Board's intention to impose similar restrictions.

The permit will also be subject to all applicable provisions of any treaty, convention, or agreement affecting international air transportation to which the United States and Cuba shall be parties.

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DEPARTMENT OF COMMERCE
Charles Sawyer, Secretary

Civil Aeronautics Administration
Charles F. Horne, Administrator

Ben Stern, Director
Office of Aviation Information

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CAA and CAB Releases

Copies of CAA releases may be obtained from the CAA Office of Aviation Information. CAB releases are obtainable from the Public Information Section of the Board.

Administration

CAA Urges Discussion Meetings to Promote Private Flying Safety—(CAA 51-44) (August 8).

CAA Stall Recovery Demonstration Apparently Paying Dividends—(CAA 51-45) (August 13).

CAA Warns Aliens Airmen Certificates to Expire—(CAA 51-46) (August 26).

CAA Big Buyer in Electrical Supply Field—(CAA 51-47) (August 24).

Personal-Aircraft Owner's Guide Issued by CAA—(CAA 51-48) (August 17).

Southwest Pilots Laud New Farm Plane During Service Test Tour—(CAA 51-49) (August 26).

CAA Sells Surplus Planes; U. S. Treasury Gets \$800,000—(CAA 51-50) (September 4).

Survey Shows 6,400 Duster Pilots, 61% Subject to Military Call—(CAA 51-51) (September 6).

Address by Charles F. Horne, Administrator of Civil Aeronautics, 6th Annual National Flying Farmers' Convention, Texas Hotel, Fort Worth, Texas, (August 27, 1951) "The Future of Agricultural Flying."

Board

CAB Approves DC-6 Daytime Coach Service—(CAB 51-54) (July 30).

CAB Sets Hearing Date for Pan American World Airways Accident Near Monrovia, Liberia, Africa—(CAB 51-55) (July 31).

Board Sets Final Mail Rate for the Big Four Air Carriers—(CAB 51-56) (August 7).

Board Denies Merger of West Coast Airlines and Southwest Airways Company—(CAB 51-57) (August 13).

CAB Grants Cuban Airlines Temporary Authorization from Havana to New York—(CAB 51-58) (August 14).

CAB Sets Hearing Date for Eastern Air Lines Accident Near Richmond, Va.—(CAB 51-59) (August 21).

Board Proposes Final Mail Rates for Pan American's Pacific Division—(CAB 51-60) (August 23).

Board Denies Modern Air Transport Exemption—(CAB 51-61) (August 27).

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Transition Program Developed by CAA For Change-Over to Common System

An up-to-date report on the Transition Program for a common system of air navigation and traffic control was given recently at the Air Command and Staff School, Maxwell Air Force Base, Alabama, by Joseph Blatt, Chief, Planning Division, CAA Office of Federal Airways. Highlights of this report follow:

The CAA whose responsibility it is to plan for, install and operate the ground aids required for the Common System, has developed a Transition Program designed to make the changes necessary to raise aviation to the Common System level.

Basically the Transition Program converts the present navigation system to a system which provides the pilot with continuous information as to his position in space, utilizes radar as a terminal aid and traffic control facility in congested areas, provides direct communication between the pilot and the air route traffic controller and utilizes electronic and electro-mechanical techniques for the display and relay of information.

The Omni-range.—The keystone of the air navigation system of the immediate future is the very high frequency omni-directional radio range—the omni-range. This facility will replace the low/medium frequency 4-course radio range which has been in use for the past 20 odd years.

A comparison of this omni-range with the 4-course range clearly indicates the superiority of the omni. The omni-range operates in a static-free portion of the radio spectrum, 112-118 mc, thus making range reception possible even during periods of thunderstorms and atmospheric disturbances. With the omni-range, course accuracy is not dependent upon the pilot's hearing acuity. The course indication is displayed in the cockpit on a visual meter which immediately shows the pilot whether he is on course or whether he is to the left or right of his course. To eliminate the possibility of dangerous confusion between quadrants, the pilot flying the old type 4-course range must fly a complex time-consuming orientation pattern.

With the omni, a simple ambiguity meter tells the pilot whether the bearing he is flying is "to" or "from" the range station. The simplicity of omni navigation and the safety provided by this aid should be important factors in the advancement of aviation.

Instead of being limited to four courses, as is the case with the L/MF range, the omni provides the pilot with an infinite number of tracks or courses radiating from the range station, providing navigational guidance throughout 360° of azimuth. Cross checks or readings on two or more facilities may be used by pilots for fixing purposes.

The CAA expects to operate a total of approximately 500 omni-ranges. 419 omni-ranges have been programmed through Fiscal Year 1951. Of these, 342 have been commissioned at this time. The remainder in the program are either operating on test, to be commissioned shortly or are under construction. It is anticipated that the CAA enroute omni-range program will be substantially completed by September 30, 1951.

The Instrument Landing System.—In the terminal area, the CAA is installing an Instrument Landing System which provides lateral and vertical guidance to aircraft making approaches to high traffic density airports during periods of low visibility.

The ILS uses ground transmitters located at the airport to project two radio beams into space. One beam, called the localizer, operates in the 108-112 mc band and is directed down the runway out into the approach zone and provides lateral guidance to aircraft approaching the airport, keeping the aircraft on an electronic track over the runway centerline extended. The second beam, called the glide path, operates in the 328.6-335.4 mc band and controls

the plane's rate of descent and vertical angle of approach.

The pilot making an ILS approach watches a cross pointer indicator in the cockpit. This instrument consists of two needles, one hinged vertically and one hinged horizontally and a bull's eye in the center of the indicator. To provide fail-safe protection, flag alarms appear on the face of the indicator whenever the pilot is out of range of either the glide path or the localizer or when either transmitter is operating inaccurately. The movement of the horizontal needle is actuated by the glide path transmitter on the ground, and the vertical needle by the localizer transmitter.

When the plane is on the correct path, that is, when the plane is landing on the localizer beam and descending at the proper rate, the needles in the cross pointer indicator will be crossed at right angles within the bull's eye. By watching the indicator, the pilot can tell when he begins to deviate from the approved approach path, and therefore can immediately take the proper remedial action. 75 mc marker transmitters, which control a coded flashing light in the cockpit and transmit a high frequency readily identifiable tone, are installed along the approach path. These markers give the pilot an indication of how far he has progressed along his approach path.

The current Airway Planning Standards indicate that there is a requirement for approximately 180 Instrument Landing Systems at the major terminal airports in the United States. At the present time, the CAA is operating 96 Instrument Landing Systems, and in addition, 80 are in various stages of survey, construction, final installation, and testing.

The recent development of a low-powered terminal omni-range will provide aviation with a flexible terminal aid incorporating many of the advantages of both the omni-range and the ILS localizer. Evaluation tests, now underway, appear to justify the contention that the omni-range can be utilized as a low approach terminal aid as well as an enroute facility. This terminal omni will be installed at low traffic density locations which do not justify the expenditures required for a full ILS.

Visual Aids.—Besides the electronic equipment described above there is a requirement for visual aids in the terminal area. These aids include High Intensity Runway Lights, Runway and Taxiway Marking, Taxiway Lighting, Traffic Control Lights and Markings, and High Intensity Approach Lights. With the exception of the Traffic Control Lights and Marking, all of the equipments required for the visual aids portion of the program have been developed and are available for procurement.

Problems of configuration and standards still plague the implementing agencies, but it is hoped that these can be resolved in short order. The CAA High Intensity Approach Lighting Program is now getting underway. Twenty installations have been commissioned and 12 additional are in some stage of construction.

The ILS and omni-range provide the pilot with track information but do not provide a ready means for pin-pointing a pilot's geographical position.

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Board Order Denies Modern Air Transport Request for Exemption

The Civil Aeronautics Board late last month refused to issue an exemption to Modern Air Transport, Inc. to engage in air transportation as a large irregular air carrier. The Board stated that Modern's operations, primarily between New York and Puerto Rico and Miami and Puerto Rico, were conducted with a regularity and frequency not authorized under the Board's exemption regulations. The Board said that it is convinced that Modern's unauthorized operations were conscious and deliberate and that the Board must find Modern "not sufficiently trustworthy to be entrusted with an exemption to engage in irregular transportation."

Modern, which is based in New York, has been operating as a large irregular air carrier since 1947 under the blanket exemption provided for in the Board's Economic Regulation Part 291. The company filed an application for an individual exemption in June 1950, in compliance with the Board's requirement in amended Regulation 291, and the Board in July 1950 denied Modern's application. As a result of Modern's petition for reconsideration of the Board's order of denial, hearings were held and examiner's report issued recommending denial of Modern's application. The Board's opinion of today is issued after oral argument and consideration of all the issues in this proceeding.

Modern's principal defense in this proceeding has been to attempt to demonstrate illegality in the Board's procedures for processing applications for individual exemptions. Modern averred, among other things, that the Board had "prejudged" its case in its May 25, 1950 opinion in which the basis was established for the Board's granting or denying individual exemptions, and in which the Board stated that carriers which had been operating "route type" service, in violation of the Act and the Board's regulations, would not be granted individual exemptions. The Board said that the May 25th opinion did not constitute prejudgment because the Board could, in the exercise of sound discretion, reach conclusions different from those it would form based solely upon the records and reports of the carrier in the Board's files. When a litigant is afforded a hearing, the Board said, especially at its own request, as is the case in this proceeding, it cannot complain of the procedures followed merely because of a failure to prevail on the merits.

Joseph P. Adams, Member, concurred with the majority in the ultimate decision reached, in view of Modern's clearly established record of continued and flagrant violations following the Circuit Court's injunction against continuance of operation of route-type service. Mr. Adams dissented, however, on the grounds that the Board's May 25, 1950 opinion, together with the Circuit Court's order and finding, made it impossible for Modern in the hearing and oral argument to establish valid grounds for the award of an exemption. Mr. Adams therefore felt that the hearing and oral argument in this case served no useful purpose since . . . "Certainly the majority cannot contend that the hearing granted Modern Air Transport, Inc. was a review of the decision of the Circuit Court of Appeals."

CAB Approves DC-6 Daytime Coach Service

The Civil Aeronautics Board recently approved, for a period of one year, DC-6 coach service between New York and Miami by National Airlines at a fare of \$58.00 for one-way non-stop flights during daylight hours. The regular one-way fare between these points is \$75.70 on DC-6 airplanes.

Official Actions Civil Aeronautics Board

Regulations

Amdt. 43-7.....Effective August 1, 1951
Amends Part 43 with respect to flight area limitations for student pilots.

Amdt. 42-8.....Effective August 7, 1951
Amends Part 42 with respect to radio communications system and navigational equipment for large aircraft.

Amdt. 42-9.....Effective August 10, 1951
Amends Part 42 with respect to Second Pilot Qualifications for Large Aircraft Operations under Part 42.

Safety Orders

S-425 grants Consolidated Vultee Aircraft Corporation waiver of section 4b.353 (f) respecting knob shape of flap, landing gear, and supercharger controls; denies request for waiver of section 4b.611. (July 16)

S-426 denies request of Paul Alexander Chatham for modification of the examiner's order of suspension of his airman certificate for 90 days, or that he be permitted to pay a civil penalty. (July 16)

S-427 terminates, effective July 16, 1951, the suspension of the pilot certificate of Otto Theodore Trapp. (July 16)

S-428 suspends, effective July 24, 1951, the air carrier operating certificate of Aviation Corporation of Seattle, d/b/a Westair Transport until such time as the Administrator of Civil Aeronautics has made certain determinations in the matter; terminates emergency suspension imposed by the Board's order No. S-362 (July 19)

S-429 denies appeal of Charles C. Todd from the examiner's initial decision and order in the matter of a 90-day suspension of his airman certificate. (July 23)

S-430 modifies examiner's order so as to suspend the pilot certificate of Melvin Knopf for 60 days, effective July 23, 1951, subject to stated provision.

S-431 denies petition of B. S. Nadiak for reconsideration of the Board's decision and order No. S-400 in the matter of the violation of sections 60.19 and 60.12 of the Civil Air Regulations. (July 24)

S-432 denies petition of Francis J. Piracy, Jr., for modification of the examiner's order in the proceeding revoking his airman student pilot certificate, so as to allow him to reenter flight training under the G. L. Bill prior to July 25, 1951. (July 25)

S-433 orders that the suspension of the airline transport pilot certificate of B. S. Nadiak ordered in order No. S-400 become effective on August 6, 1951. (July 26)

S-434 terminates proceeding in the matter of the complaint of the Administrator of Civil Aeronautics against Gerald C. Francis. (August 3)

S-435 orders that the suspension of airline transport pilot certificate of B. S. Nadiak ordered in order No. S-400 become effective on September 10, 1951. (August 3)

S-436 modifies examiner's order in the matter of the complaint of the Administrator of Civil Aeronautics against Victor Eugene Johnson so as to revoke on August 13, 1951, any pilot certificate held by him, and that no pilot certificate of any type shall be issued to him prior to February 13, 1952. (August 3)

Airline Orders

E-5445 amends order No. E-5102 in the *Empire Certificate Renewal* case so as to include consideration of the petition of the City and County of Walla Walla and the Walla Walla City-County Airport Board for authorization of service by the United Air Lines between Walla Walla and Boise, Idaho, without a stop at Pendleton, Oregon (June 15).

E-5446 approves certain agreements embodied in resolutions adopted by mail vote of the Traffic Conference of IATA between Pan American World Airways, various air carriers, and other carriers relating to rates (June 15).

E-5447 denies application of Aviation Corporation of Seattle for an exemption which would permit it to engage in certain air transportation as authorized by Part 291; terminates temporary exemption (June 18).

E-5448 orders Colonial Airlines, and certain of its officers, to cease and desist from stated practices and conduct in violation of certain sections of the Act and Part 241 of the Economic Regulations (June 18).

E-5449 orders that the bill of particulars filed in the matter of the investigation of the practices and conduct of Colonial Airlines and certain of its officers no longer be withheld from public disclosure (June 18).

E-5450 denies motion of American Air Transport for a supplemental examiner's report in the matter of its application for an exemption which would permit it to engage in air transportation as authorized by Part 291 (June 18).

E-5451 grants application of Economy Airways for a hearing in the matter of its application for an exemption which would permit it to engage in certain air transportation as authorized by Part 291 (June 19).

E-5452 authorizes West Coast Airlines to suspend service at Anacortes, Mt. Vernon, and Everett, Wash., and McMinville, Ore., until 60 days after final decision of the Board in the *West Coast Renewal-United Suspension* case (June 20).

E-5453 authorizes Frontier Airlines, with stated provision, to omit a stop at Gallup, New Mexico, on one daily round-trip flight between Farmington and Albuquerque, New Mexico, and Winslow, Ariz., on route No. 73; grants exemption from the provisions of section 401 (a) of the Act so as to permit the service authorized until 60 days after the Board's final decision in the *Frontier Renewal Proceeding*; otherwise denies (June 20).

E-5454 denies petition of Delta Air Lines for reconsideration of the Board's order No. E-5369 insofar as it severed and denied consolidation of amendment No. 1 to its application in Docket No. 4836 proposing, among others the operation of a route segment from Richmond and/or Lynchburg, Va., to Washington, D. C., in conjunction with the routes of Piedmont Aviation (June 20).

E-5455 denies petition of Pan American World Airways for

reconsideration of the Board's order No. E-5077, and application for exemption from the hearing requirements of section 203.3 of the Economic Regulations so as to permit inauguration of nonstop service in foreign air transportation (June 20).

E-5456 denies petition filed on June 4, 1951, by Pioneer Airlines for reconsideration of the Board's order No. E-5110 in the *Pioneer Certificate Renewal* case (June 20).

E-5457 orders All American Airways to show cause why the Board should not fix certain temporary mail rates over its entire system (June 21).

E-5458 dismisses application of Trans Caribbean Air Cargo Lines for an exemption under section 416 of the Act (June 21).

E-5459 authorizes Oark Airlines to omit service to Bloomington and Danville, Ill., on segment 2 of route No. 107 on one daily eastbound flight requiring landings during the hours of darkness, until the airport at such point is adequate for night operations (June 21).

E-5460 permit and order grant "Area" Aerovias Ecuatorianas, C.A., a permit authorizing the foreign air transportation of persons, property, and mail between Quito and Guayaquil, Ecuador, the intermediate point Panama City, Panama, and Miami, Fla., otherwise denies. Approved by the President June 21, 1951 (June 11).

E-5461 amends and corrects the Board's order E-5361 by striking the word "director" and substituting "executive vice president and general manager" as being the position held by Robert E. Peach in Robinson Airlines Corporation (June 21).

E-5462 orders Trans-Pacific Airlines to show cause why the Board should not fix, determine, and publish the mail rates set forth in an attached statement, over its entire system (June 21).

E-5463 fixes and determines final mail rates to be paid Southwest Airways Company on and after May 1, 1951, over its entire system (June 21).

E-5464 institutes proceeding to determine whether amended Agreement C.A.B. No. 3735-A which adds Chicago, Ill., as a new point at which advance charges to local cartage operators may be eliminated, among other things, is adverse to the public interest; consolidates it into the proceeding instituted by order No. E-5357, in Docket No. 4850, et al (June 25).

E-5465 grants American Airlines, Eastern Air Lines, United Air Lines, and Pan American World Airways leave to intervene in the matter of the application of Robin Airlines for an individual exemption (June 25).

E-5466 denies petition of Pan American World Airways for reconsideration of the Board's order No. E-5019 in the matter of its application for an exemption which would permit it to serve Tokyo and a point within the Island of Okinawa on the same flight (June 25).

E-5467 opinion and order modify opinion and amend order No. E-4870 so as to establish final mail rates to be paid Inland Air Lines and Western Air Lines for past periods (June 26).

E-5468 authorizes Central Airlines to omit service to Arkansas City-Winfield, Kans., on segment 5 of route No. 21 on one daily northbound flight requiring landings during hours of darkness until the airport at such point is adequate for night operations (June 26).

E-5469 opinion and order require, with stated provision, that upon one day's notice the tour basing fares proposed by Pan American World Airways, Pan American-Grace Airways, and Braniff Airways between points in the United States and points in South America be canceled by the filing of an appropriate tariff within 20 days after the date of the order (June 26).

E-5470 approves, subject to stated conditions, agreement between American Air Export and Import Company and 7 other air carriers relating to a tender to the military agencies of the United States (June 26).

E-5471 approves, subject to stated conditions, agreement between Aero Finance Corporation and 28 other air carriers relating to a tender to the military agencies of the United States (June 26).

E-5472 dismisses joint applications of U. S. Airlines and Slick Airways for approval of a certain agreement and for an exemption under the Act (June 27).

E-5473 grants Transocean Air Lines exemption until June 30, 1952, with stated provisions, from the provisions of Title IV of the Act and Part 291 so as to permit it to engage in certain air transportation in the Trust Territory of the Pacific Islands pursuant to a contract with the High Commissioner (June 26).

E-5474 fixes certain temporary mail rates for All American Airways over its entire system (June 27).

E-5475 approves, subject to stated condition, the interlocking relationship arising out of the holding by Peter K. McLean of certain positions in Hawaiian Airlines, Ltd., and Kahului Railroad Company, Ltd. (June 28).

E-5476 orders Northern Consolidated Airlines to show cause why the Board should not establish certain temporary mail rates over its routes certificated for the transportation of mail (June 28).

E-5477 exempts Northwest Airlines until May 18, 1951, from the provisions of section 401(a) of the Act, insofar as they would otherwise prohibit Northwest from serving Taipei, Formosa, as an intermediate point on its Pacific route (June 28).

E-5478 grants The Flying Tiger Line exemption during June and July, 1951, with stated condition, so as to permit it to operate 13 one-way flights from points in Germany to New York, carrying refugees under contract with the IRO (June 28).

E-5479 grants The Flying Tiger Line exemption during June and July 1951, with stated provisions, so as to permit it to perform one flight on behalf of INS from a point in the United States to Pakistan transporting deportees to depart on or about June 17, 1951, and flights from points in southern California to points in Mexico, transporting deportees, until June 30, 1951 (June 28).

E-5480 grants Resort Airlines exemption until December 21, 1951, subject to stated conditions, so as to permit it to transport agricultural laborers between certain points in the United States and the West Indies and Caribbean; otherwise denies (June 29).

E-5481 approves, subject to stated condition, the purchase by Northeast Airlines of six Convair Model 340 aircraft from Consolidated Vultee Aircraft Corporation (June 29).

E-5482 grants, subject to stated condition, Pan American-Grace Airways exemption from the provisions of section 401(a) of the Act and its certificate for route FAM-9, so as to omit a stop at Oruro, Bolivia, on flights between La Paz and Cochabamba, Bolivia, until such time as adequate airport facilities are available at Oruro; otherwise denies (June 29).

E-5483 dismisses complaints of Braniff Airways, and Chicago and Southern Air Lines with respect to the "Family Fare Plan" proposed by air carriers (June 29).

E-5484 authorizes All American Airways to suspend service temporarily at Butler, Pa., on route No. 97, until such time as airport facilities are adequate for scheduled air carrier operations by All American (June 29).

E-5485 approves, subject to conditions, certain agreements, and defers action for 90 days on another agreement embodied in resolutions of IATA Traffic Conference meetings between Pan American World Airways, various air carriers, foreign air carriers, and other carriers, relating to rate matters (June 29).

E-5486 denies motion filed June 19, 1951, by the Board of County Commissioners of Dade County, Fla., the Dade County Port Authority, and Greater Miami Traffic Association for consolidation of the proceedings in the *Havana-New York Foreign Air Carrier Permit* case and Dockets Nos. 3785 and 2967 (July 2).

E-5487 grants Airline Transport Carriers, Inc., exemption for 2 years, subject to stated conditions, so as to permit it to engage in interstate air transportation as an irregular carrier as authorized by Part 291; terminates temporary exemption granted by Section 291.16 (July 2).

E-5488 grants National Airlines leave to intervene in the matter of the application of New England Air Express for an exemption (July 3).

E-5489 denies petitions of Continental Air Lines and Mid-Continent Airlines for reconsideration of order No. E-5426 in the matter of the application of Braniff Airways for an amendment of its certificate for route No. 9 (July 3).

E-5490 dismisses application of Conair Air Lines for exemption so as to engage in certain air transportation pursuant to contracts that may be awarded by any Department of the Military Establishment (July 2).

E-5491 defers, temporarily, all further procedural steps in the proceeding instituted by order No. E-2480 to determine whether the public convenience and necessity require elimination of certain competitive services between Chicago, Ill., and Washington, D. C. (July 2).

E-5492 dismisses complaint of Northwest Airlines concerning certain general commodity rates proposed by Capital Airlines to become effective Jan. 10, 1951 (July 3).

E-5493 denies application of Trans-Pacific Airlines, Ltd., for exemption from the requirements of the Act to permit it to furnish free or reduced-rate transportation to officials and employees of agencies and to tour conductors (July 3).

E-5494 approves, subject to stated provisions, interlocking relationships arising out of the holding by John E. Tilford of certain positions in Railway Express Agency, Inc., the Louisville and Nashville Railroad Co., and others (July 3).

E-5495 reopens the record in the matter of an investigation of stock acquisitions in National Airlines by W. R. Grace & Co., to receive evidence solely on the issue of whether the control of National has been acquired by Grace within the meaning of section 408 of the Act; otherwise denies (July 5).

E-5496 approves, subject to conditions, certain agreements involving Eastern Air Lines and Northeast Airlines relating to the charter of Douglas DC-3 aircraft; exempts Eastern and Northeast from the public hearing requirements of section 308 (b) of the Act (July 5).

E-5497 fixes certain temporary mail rates for Northern Consolidated Airlines over its routes certificated for the transportation of mail (July 6).

E-5498 certifies to the Postmaster General that a proposed star route for the transportation of mail by aircraft from Cortez, Colo., via Blanding to White Canyon, Utah, and return does not conflict with the development of air transportation as contemplated under the Act (July 6).

E-5499 grants Professor J. Harold Tarbell exemption, with stated conditions, from the provisions of the Act so as to permit him to arrange one world-wide educational flight of approximately 47 persons, leaving New York City on July 7, 1951, stopping at certain foreign cities, and returning on or before September 1, 1951; otherwise denies (July 6).

E-5500 fixes and determines final mail rates to be paid Trans-Pacific Airlines, Ltd. on and after May 15, 1951, over its entire system (July 9).

E-5501 consolidates for hearing in this proceeding the applications of the cities of Mankato, New Ulm, Fairmont, Marshall, and Rochester, Minn., Dockets Nos. 4955, 4962, 4970, 4071, and 4974, respectively: Mid-West Airlines, Docket No. 4964, and petition of United Air Lines in Docket No. 4985; and makes United Air Lines and the cities of North Platte and Grand Island, Neb., parties to the proceeding in the matter of the application for renewal of Mid-West's certificate (July 9).

E-5502 grants Inland Air Lines, United Air Lines, Mid-Continent Airlines, certain cities and chambers of commerce in Minnesota and South Dakota, the Air Line Pilots Association, and the Postmaster General leave to intervene in the matter of the application of Mid-West Airlines for renewal of its certificate (July 9).

E-5503 grants Alaska Airlines exemption for 6 months beginning July 21, 1951, from the provisions of section 401 (a) of the Act and Part 292 so as to permit it to engage in interstate, overseas, and foreign air transportation of persons and property pursuant to contracts with any Department of the Military Establishment (July 9).

E-5504 grants Overseas National Airways (formerly Calasia Air Transport) exemption for 2 years, subject to stated conditions, so as to permit it to engage in interstate air transportation as an irregular carrier as authorized by Part 291; terminates temporary exemption granted by 291.16 (July 9).

E-5505 grants Air Services, Inc., exemption, subject to stated conditions, until October 6, 1951, from the provisions of section 401 (a) of the Act and Part 291 so as to permit it to operate 3 round trips per week between Burbank, Calif., and La Paz, Lower Calif., Mexico, carrying members of the Sportsmen's, Inc., of Burbank, and the Sportsmen's Travel Club, Inc. of Alhambra, Calif.; otherwise denies (July 9).

E-5506, E-5507 opinion and orders in the *Los Angeles Airways Certificate Renewal* case and amend certificate of Los Angeles Airways for route No. 84 and grant exemption until Sept. 30.

(Continued on Page 103)

Change-Over Readied For Common System

(Continued from Page 99)

Distance Measuring Equipment.—Distance Measuring Equipment has been developed to furnish the necessary additional factor. At each omnirange station and at each Instrument Landing System, there will be installed a Distance Measuring Equipment transmitter. The Distance Measuring Equipment, known as DME, operates in the 1000 mc band, utilizes radar pulse techniques developed during World War II and measures the time interval for a radar pulse to travel from the aircraft to the ground beacon and return to the aircraft. Since the radar pulses travel at a uniform velocity at the velocity of light (186,000 miles per second), it is a simple matter for the airborne component of the DME to convert the time intervals into distances and automatically display in the cockpit on a meter similar to an automobile speedometer, the distances in miles the aircraft is from the omni or ILS to which it is tuned. Therefore, in a suitably equipped plane, the pilot will get his azimuth or direction from the omni or ILS and his distance from these facilities by means of the DME. Since the omni and ILS are located at fixed geographical points, the pilot now has both distance and direction and therefore can accurately determine his position in space.

A test VOR-DME airway is being implemented between Chicago and New York at the present time. It is estimated that by December 1, 1951 this entire airway will be completed and operational data obtained through the use of these facilities. 16 units of airborne equipment have been procured and have been allocated to Air Force and Navy aircraft, airline aircraft, and to CAA flight inspection aircraft. These units, through the cooperation of industry and the military, will assist CAA in evaluating VOR-DME operational procedures.

The CAA has awarded a contract for the production of 450 DME's. It is anticipated that this equipment will start coming off the line this month. By December, 1951, the contractor will make delivery of this equipment at the rate of 40 units per month until the total of 450 has been delivered.

Coordinated with the development of the omnirange and DME has been the development of the Course Line Computer. Using the Computer, DME, and the omni, a pilot can fly a straight course between any two selected points under the umbrella of omnirange coverage. The pilot sets certain information into the Computer, then the Computer, using intelligence received from the DME and the omnirange transmitter, continuously solves the specific trigonometric problem involved. All the pilot has to do to stay on his pre-selected course is to keep his vertical needle centered just as he does in flying radially to or from an omnirange.

Radar Devices.—Modified and improved units of the war developed terminal radar devices have been incorporated in the Common System. The radar devices known during the war as GCA (Ground Controlled Approach) have been modified for civil operation, and split into two specific equipments: the Airport Surveillance Radar and the Precision Approach Radar.

The Airport Surveillance Radar—the ASR—acts as the eyes of the airport traffic controller during periods of restricted visibility. The ASR shows the controller on a Plan Position Indicator the location of all aircraft within 30 miles of the terminal.

The ASR will serve several purposes in addition to the obvious one of reducing collision hazards. It is used to guide or vector an aircraft to gateway positions where the Precision Radar can pick it up and the pilot can be talked down to a safe landing. It can be utilized to vector departing air-

Suspensions and Revocations . . . CAB

Suspensions

Operating an aircraft during instrument conditions when he did not hold an instrument rating and for low flying. (*While ground flying, the pilot flew into a fog-covered mountain, demolishing the aircraft and killing his passenger*)—6 months from July 20—Donald K. Covington, Baltimore, Md. (Private).

Low flight over a congested area—10 days from July 10—Kenneth R. Lynde, Worcester, Mass. (Commercial).

Operating an aircraft during the hours of darkness without displaying position lights and taking off from a public road without posting look-outs (*While attempting a take-off from the road the aircraft crashed in order to avoid colliding with an automobile traveling towards the plane*)—90 days from May 25—Paul A. Chatham, Gillett, Ark. (Private).

Operated an aircraft on a charter flight during instrument conditions when he did not hold an instrument rating, and other violations (*While operating in marginal weather, the weather closed in. In attempting to get away from the area the gas ran out and an emergency landing was made that resulted in damage to aircraft*)—60 days from June 7—Donald L. Day, Kansas City, Mo. (Commercial).

Performing acrobatics at a low altitude, over a congested area, and within a civil airway; and for other violations—90 days from July 31—Arthur Cotton, Columbia, Mo. (Private).

craft directly to their enroute airway, thus greatly reducing departure delays. It will be used to vector or monitor aircraft proceeding through the terminal area. The element of certainty introduced by Surveillance Radar will permit landings in more rapid succession than would be safe otherwise and will reduce delays caused by missed approaches.

The CAA Facility Implementation Program calls for the establishment of approximately 83 ASR units in the United States. At the present time 10 of these units are commissioned and in use and 43 additional units are being produced.

The Precision Approach Radar—the PAR—is considered a complementary facility to the ILS; whereas, the ILS requires that the aircraft be equipped with a specialized receiver, the operation of the PAR requires only simple two-way radio communications. With the PAR the airport traffic controller watching an azimuth and elevation scope in the tower follows the movement of aircraft in the approach zone and directs the pilot down to the runway by transmitting instructions using radiotelephone.

Besides providing a partially equipped aircraft with a means of making an instrument approach to an airport in a congested terminal area, the PAR is used as a ground monitoring device for aircraft making an ILS approach. Used together, the ILS and PAR give the pilot and the control agency a continuous double check on the aircraft's position and constitute the safest and surest instrument landing method known to date.

CAA's Establishment Program calls for the installation of some 57 Precision Approach Radars in the United States; 10 of these are commissioned and in use today, and an additional 13 are under construction.

Other Devices.—In order to assist the traffic controller in the identification of targets appearing on the ASR scope, the CAA is planning to use VHF/ADF equipment in association with each ASR. The VHF/ADF will provide the controller with a visual means of identifying the aircraft in voice contact with the comptroller. When the pilot opens his mike, a red radial line appears on the scope, bisecting the pip representing his aircraft. It's planned to modify this program so that the equip-

Operating an aircraft within a control zone when the ceiling was below minimum without obtaining clearance from traffic control and failing to maintain radio contact with traffic control—30 days from July 20—Verner H. Evers, Vancouver, Wash. (Private).

Revocations

Operating an aircraft while intoxicated and other violations—Ephraim Stewart, Ellerson, Va. (Private).

Carrying a passenger—George S. Feiden, Washington, D. C. (Student).

Buzzing a bathing beach while it was being used by more than 100 children, operating an aircraft that had not been given an annual inspection, and failing to keep appropriate records in the aircraft—Andrew E. Schaap, Stroudsburg, Pa. (Private).

Carrying a passenger (*The aircraft crashed into a telephone pole during an attempted cross-wind landing*)—Homer P. Fowler, Buffalo, Mo. (Student).

Carrying a passenger—John N. Shepherd, Washington, D. C. (Student).

Operating an aircraft while under the influence of intoxicating liquor and other violations—Elmer W. Miles, Concord, Calif. (Private).

Low flying while carrying a passenger and taking off with insufficient fuel (*While flying at a 50-foot altitude the aircraft struck a power line and crashed, damaging the aircraft and killing the passenger*)—Harold Thompson, Prosser, Wash. (Private).

ment will be capable of identifying military aircraft transmitting in the UHF band.

An airborne radar safety beacon is being developed at the present time, and CAA is making the necessary plans for the modification of the ASR equipment so that the signal from the airborne beacon may be received by and displayed on the ASR scope. The radar safety beacon, besides providing a means of identifying a radar target, will greatly increase the range and usefulness of the ASR.

Mechanical Interlocks linking together the air traffic control center and the airport traffic control tower have been developed to expedite the exchange of information concerning the status of air traffic at specific fixes. Information concerning the availability or occupancy of altitudes over fixes jointly controlled by a tower and a center is displayed by lights on indicator panels at both points.

Development work has indicated that the existing Interlock system may be modified so as to integrate the interlock equipment operationally with radar control. These modifications will include the exchange of identity data and an automatic method of displaying the data transferred.

The CAA anticipates requirements for approximately 75 Mechanical Interlock units. Seventeen of these units have already been commissioned and 19 more installations are underway.

Additional electronic devices are required to complete the transition to the Common System. These devices include an Air Traffic Control Signalling System, a Traffic Delay Predictor, and Airport Surface Detection Equipment. Operational requirements for these equipments are being prepared and development work should get underway shortly.

Enroute Communication.—An analysis of the various studies made in connection with the outstanding techniques employed in air traffic control during the Berlin Airlift indicates that some of the principles used are adaptable to U.S. domestic procedures. One of these principles was the use of direct communications between the enroute controller and the pilot during the critical period of transition between enroute control and approach

(Continued on Page 104)

Regulations of The Administrator

Through September 1, 1951

Note: Regulations of the Administrator marked with an asterisk (*) on the list given below may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C., at the prices indicated. Remit check or money order, made payable to the Superintendent of Documents, directly to the Government Printing Office. Copies of amendments may be obtained free of charge from the Office of Aviation Information, CAA, Washington 25, D. C., or may be found in the Federal Register for the dates indicated in parentheses. Copies of the Federal Register are obtainable from the Superintendent of Documents.

Organization

*Part 400—Organization and Functions. (10¢.)
Amendment 1 (July 11, 1951). Amendment 2 (August 14, 1951).

Procedures

*Part 405—General Procedures. (5¢.)
*Part 406—Certification Procedures. (10¢.)
*Part 407—Recordation Procedures. (5¢.)
*Part 408—Enforcement Procedures. (5¢.)
(Amendment 1 available from CAA.)

Rules

Airmen

*Part 450—Inter-American Aviation Training Grants. (5¢.)

Aircraft

*Part 501—Aircraft Registration Certificates. (5¢.)
*Part 502—Dealers' Aircraft Registration Certificates. (5¢.)
*Part 503—Recordation of Aircraft Ownership. (5¢.)
*Part 504—Recordation of Encumbrances Against Specifically Identified Aircraft Engines. (5¢.)
*Part 505—Recordation of Encumbrances Against Aircraft Engines, Propellers, Appliances, or Spare Parts. (5¢.)
*Part 506—Airworthiness Directive Recordation. (May 1, 1951.)
*Part 514—Technical Standard Orders — C Series — Aircraft Components. (January 25, 1951.)

Airports

*Part 550—Federal Aid to Public Agencies for Development of Public Airports. (10¢.)
(Amendments 1-14 available from CAA.)
*Part 555—Acquisition of Government-owned Lands for Public Airports Purposes. (5¢.)
*Part 560—Reimbursement for Damage to Public Airports by Federal Agencies. (10¢.)
(Amendments 1-2 available from CAA.)
*Part 570—Rules of Washington National Airport. (5¢.)
(Amendments 1-2 available from CAA.)
*Part 575—Federal Civil Airports on Canton and Wake Islands. (5¢.)

Air Navigation

*Part 600—Designation of Civil Airways (including amendments 1 through 18). (10¢.)
(Amendments 19-52 available from CAA.) Amendment 53 (August 10, 1951.)
*Part 601—Designation of Control Areas, Control Zones and Reporting Points (including amendments 1 through 22). (15¢.)
(Amendments 23-56 available from CAA.) Amendment 57 (August 10, 1951.)
*Part 609—Standard Instrument Approach Procedures. (July 27, 1951.) Amendment 1 (August 25, 1951.)
*Part 610—Minimum En Route Instrument Altitudes. (July 27, 1951.) Amendment 1 (August 4, 1951.)
*Part 612—Aeronautical Fixed Communications. (5¢.)
*Part 617—Airport Traffic Control Rules. (April 21, 1951.)
*Part 620—Security Control of Air Traffic. (5¢.)
(Amendments 1-3 available from CAA.) Amendment 4 (August 23, 1951.)
*Part 625—Notice of Construction or Alteration. (5¢.)

Miscellaneous

*Part 635—Reproduction and Dissemination of Current Examination Materials. (Available without charge from CAA.)

Hempel a Pioneer in Radio Aids

The June 20th issue of the Journal, which outlined 25 years of aviation development, obviously could not include the names of all who made major contributions during that period. It has been pointed out, however, that Carl B. Hempel of Cheyenne, Wyoming, was one of the pioneers in development of early radio aids to air navigation, and the editors are glad to extend this recognition of his services.

Scheduled Air Carrier Operations

[Source: CAB Form 411]

Domestic: June 1951

Operator	Revenue miles	Revenue passengers	Revenue passenger miles (000)	Passenger seat miles (000)	Revenue passenger load factor (percent)	Ton-miles flown		
						Express	Freight	United States mail
Trunk Lines								
American Airlines.....	6,542,293	470,500	241,744	293,767	82.29	809,926	2,748,054	1,260,026
Braniff Airways.....	951,708	68,151	23,187	33,289	69.65	82,205	201,429	129,872
Capital Airlines.....	2,255,741	198,572	64,558	89,658	72.00	229,171	439,374	170,226
Chicago & Southern Air Lines.....	705,378	40,572	15,018	22,641	66.33	59,257	62,185	50,220
Colonial Airlines.....	358,091	23,235	5,876	10,278	57.17	6,958	7,550	8,306
Continental Air Lines.....	534,835	25,384	9,610	15,388	62.45	13,899	42,689	36,588
Delta Air Lines.....	1,319,494	76,548	33,302	46,486	71.64	91,338	260,871	125,156
Eastern Air Lines.....	4,448,830	301,603	128,500	187,323	68.60	381,111	396,069	431,018
Inland Air Lines.....	246,495	10,055	4,213	6,151	68.49	10,410	12,318	18,646
Mid-Continent Airlines.....	722,929	35,695	10,896	17,612	61.87	24,464	43,953	38,967
National Airlines.....	1,140,849	49,609	29,887	45,351	65.90	28,304	391,462	89,486
Northeast Airlines.....	448,550	42,995	8,293	13,632	60.83	14,869	23,226	12,267
Northwest Airlines.....	1,049,670	74,312	51,199	62,865	81.44	162,445	261,568	233,380
Trans World Airlines.....	4,382,510	208,019	159,671	175,686	90.88	634,377	1,163,472	1,119,363
United Air Lines.....	3,391,457	178,228	112,534	133,061	84.57	499,503	1,140,399	926,036
Western Air Lines.....	819,598	62,705	24,368	31,723	76.81	43,600	40,403	155,684
Trunk Total.....	29,318,428	1,866,183	922,856	1,184,911	77.88	3,091,837	7,235,022	4,805,241
Feeder Lines								
All American Airways.....	284,978	22,295	3,204	5,984	53.54	13,043	0	5,424
Bonanza Air Lines.....	75,155	2,516	651	1,538	42.33	398	1,065	824
Central Airlines.....	115,092	3,109	393	2,417	16.26	1,068	445	1,781
Empire Air Lines.....	105,209	5,101	974	2,209	44.09	1,998	0	2,726
Frontier Airlines.....	386,982	10,749	3,112	7,740	40.21	8,581	28,018	14,176
Helicopter Air Service.....	28,670	0	0	0	—	0	0	2,204
Lake Central Airlines.....	104,692	3,189	509	2,077	24.51	6,205	0	1,101
Los Angeles Airways.....	31,461	0	0	0	—	0	0	4,669
Mid-Continent Airlines.....	81,287	4,239	915	1,707	53.60	4,343	3,373	2,229
Mid-West Airlines.....	67,238	293	45	269	16.73	0	0	918
Ozark Airlines.....	178,510	4,680	801	3,854	20.78	5,811	0	2,272
Piedmont Aviation.....	367,755	19,041	4,392	7,723	56.87	7,801	13,844	5,279
Pioneer Air Lines.....	323,583	13,936	3,590	7,766	46.23	3,603	11,923	8,863
Robinson Airlines.....	128,591	8,996	1,400	2,681	52.22	5,617	3,059	2,158
Southern Airways.....	258,696	8,809	1,557	5,432	28.66	6,361	0	7,021
Southwest Airways.....	211,478	13,832	2,885	4,441	64.96	5,179	9,588	7,025
Trans-Texas Airways.....	243,119	6,931	1,592	5,105	31.19	1,904	4,681	3,803
West Coast Airlines.....	127,730	10,043	1,637	2,682	61.04	1,446	3,223	2,751
Wiggins, E. W., Airways.....	37,812	348	33	145	22.76	331	0	104
Wisconsin-Central Airlines.....	182,708	9,948	1,658	3,837	43.21	11,800	0	5,158
Feeder Total.....	3,340,746	148,055	29,348	67,607	43.41	85,489	79,169	80,486
Territorial Lines								
Caribbean-Atlantic Airlines.....	47,420	6,990	567	1,253	45.25	0	1,343	763
Hawaiian Airlines.....	287,640	33,785	4,417	6,204	71.20	7,499	72,123	2,404
Trans-Pacific Airlines.....	89,032	11,551	1,422	2,493	57.04	190	2,424	1,895
Territorial Total.....	424,092	52,326	6,406	9,950	64.38	7,689	75,890	4,562
Grand Total.....	33,083,266	2,066,564	958,610	1,262,468	75.93	3,185,015	7,390,081	4,890,289

International and Overseas: June 1951

Operator	Revenue miles	Revenue passengers	Revenue passenger miles (000)	Passenger seat miles (000)	Revenue passenger load factor (percent)	Ton-miles flown			
						Express	Freight	United States mail	Parcel post
American Airlines.....	232,440	8,874	6,299	11,488	54.83	575	150,939	13,105	0
Braniff Airways.....	265,202	2,354	5,162	11,339	45.52	0	176,806	9,136	0
Chicago & Southern Air Lines.....	138,854	2,285	2,901	6,423	45.17	0	41,454	2,831	191
Colonial Airlines.....	68,306	4,119	3,214	3,552	90.48	0	1,827	1,662	106
Eastern Air Lines.....	257,452	6,493	9,130	15,066	60.60	0	19,030	44,511	0
National Airlines.....	99,536	8,577	2,280	5,436	41.94	610	25,133	1,224	0
Northwest Airlines.....	595,555	8,324	14,037	23,689	59.26	24,376	651,264	127,033	0
Pan American World Airways:									
Atlantic Division.....	1,409,808	30,212	49,730	71,309	69.74	936,447	0	337,120	91,517
Latin American Division.....	2,444,446	64,374	64,458	103,083	62.53	0	1,787,648	244,083	0
Alaska Operations.....	294,803	5,767	5,864	12,467	47.04	561,096	0	41,420	0
Pacific Operations.....	799,337	8,803	28,867	38,763	74.47	624,132	0	302,832	0
Pan American-Grace Airways.....	480,462	9,333	9,253	17,490	52.90	199,157	0	31,117	7,111
Trans World Airlines.....	1,255,305	15,250	38,136	53,042	71.90	0	492,072	292,796	53,211
United Air Lines.....	190,804	3,268	8,091	10,111	80.02	0	27,555	46,483	0
Uraba, Medellin & Central Airways.....	8,523	212	70	171	40.94	4,334	0	0	0
Total.....	8,540,638	178,245	247,492	383,429	64.55	2,350,727	3,373,728	1,495,353	152,136

Domestic Passenger Miles Flown (Total Revenue and Nonrevenue, in Thousands)

	January	February	March	April	May	June	Total
Trunk.....	744,984	689,234	864,819	865,751	890,976	950,740	5,006,504
Feeder.....	18,080	17,205	22,774	24,014	28,831	31,185	142,089
Territorial.....	3,886	3,613	4,459	3,759	4,727	6,499	26,943
Total.....	766,950	710,052	892,052	893,524	924,534	988,424	5,175,536

Scheduled Air Carrier Operations

(Continued on Page 104)

International and Overseas: January-June 1951, 1950

Operator	Revenue miles January-June		Revenue passengers January-June		Revenue passenger miles (000) January-June		Passenger seat miles (000) January-June		Revenue passenger load factor (percent) January-June	
	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950
American Airlines.....	1,426,369	1,134,606	57,986	42,849	43,725	32,690	72,932	55,194	59.95	59.28
American Overseas Airlines (ceased opr. 9/26/50).....	—	2,875,310	—	69,572	—	93,715	—	144,633	—	64.80
Brant Airways.....	1,581,335	1,138,627	13,725	8,314	28,691	17,644	68,740	48,607	41.74	36.30
Chicago & Southern Air Lines.....	831,335	1,028,504	13,407	11,412	15,610	13,982	38,029	41,899	41.05	33.37
Colonial Airlines.....	387,375	235,157	20,729	7,568	16,267	6,102	20,143	10,936	80.76	55.80
Eastern Air Lines.....	1,127,414	369,299	22,424	8,612	29,452	8,956	65,872	18,294	44.71	48.96
National Airlines.....	679,545	387,474	57,915	40,876	15,272	10,869	36,941	21,583	41.34	50.36
Northwest Airlines.....	3,114,299	3,068,907	34,011	29,542	58,434	44,117	114,116	83,342	51.21	52.98
Pan American World Airways:										
Atlantic Division.....	7,445,301	5,843,473	163,462	69,891	229,756	150,695	350,922	221,654	65.47	67.99
Latin American Division.....	13,908,518	13,618,721	400,945	348,688	331,523	276,585	550,561	480,359	60.22	57.58
Alaska Operations.....	1,300,390	1,169,672	22,047	17,649	22,866	17,135	57,311	35,033	39.90	48.91
Pacific Operations.....	4,461,896	4,801,179	37,768	37,150	129,933	104,074	218,653	205,080	59.42	50.75
Pan American-Grace Airways.....	2,878,984	2,822,934	58,404	47,315	62,046	50,081	104,524	106,580	59.36	46.99
Trans World Airlines.....	6,078,316	6,189,891	63,054	54,443	160,471	147,591	263,462	230,889	60.91	63.92
United Air Lines.....	1,455,256	948,401	17,701	12,304	48,659	29,529	74,834	48,846	58.34	60.45
Uruba, Medellin & Central Airways.....	51,824	50,048	1,288	1,286	423	423	1,038	864	40.75	48.96
Total.....	46,728,157	45,677,203	984,866	791,971	1,188,128	1,004,188	2,038,078	1,753,793	58.30	57.26
Index (1950=100).....	102.30	100.00	124.36	100.00	118.32	100.00	116.21	100.00	101.82	100.00

Operator	Ton-miles flown							
	Express January-June		Freight January-June		United States mail January-June		Parcel post January-June	
	1951	1950	1951	1950	1951	1950	1951	1950
American Airlines.....	4,946	5,562	764,017	633,332	77,745	58,948	0	0
American Overseas Airlines (ceased opr. 9/26/50).....	—	1,336,283	—	0	—	662,317	—	188,681
Brant Airways.....	0	0	686,283	410,299	60,795	14,897	0	0
Chicago & Southern Air Lines.....	0	0	321,787	323,574	16,364	13,063	1,131	1,125
Colonial Airlines.....	0	0	24,733	32,991	8,922	1,516	703	438
Eastern Air Lines.....	0	0	106,465	205,321	170,486	32,841	0	2,417
National Airlines.....	7,910	110,020	150,807	0	6,538	6,496	0	0
Northwest Airlines.....	108,333	57,570	3,367,797	2,658,086	852,085	1,007,546	0	0
Pan American World Airways:								
Atlantic Division.....	5,472,893	3,800,853	0	0	1,893,770	1,201,648	524,956	326,618
Latin American Division.....	9,829,884	10,504,301	1,787,648	0	1,468,807	1,371,237	0	0
Alaska Operations.....	2,336,137	1,933,157	0	0	209,242	184,530	0	0
Pacific Operations.....	3,179,397	2,401,162	0	0	2,556,993	2,836,695	0	0
Pan American-Grace Airways.....	1,111,476	806,832	0	0	172,210	172,668	98,710	10,476
Trans World Airlines.....	0	0	2,974,367	2,668,899	1,711,726	1,285,132	286,173	217,800
United Air Lines.....	0	0	240,503	142,065	388,732	292,355	0	0
Uruba, Medellin & Central Airways.....	28,447	15,140	0	0	0	0	0	0
Total.....	22,079,423	20,970,880	10,424,407	7,074,517	9,594,415	9,141,889	851,673	747,555
Index (1950=100).....	105.29	100.00	147.35	100.00	104.15	100.00	113.93	100.00

Official Actions CAB

(Continued from Page 100)

1956, from the provisions of Section 401 of the Act so as to permit it, subject to stated conditions, to engage in air transportation of persons, property, and mail with rotary-wing aircraft in the Los Angeles, Calif., area (July 5).

E-5508 grants Trans World Airlines, the City and Chamber of Commerce of St. Louis, Mo., the City, County, and Chamber of Commerce of Denver, and the Air Line Pilots Association, International, leave to intervene in the matter of the joint application of Mid-Continent Airlines and Continental Air Lines for approval of an agreement relating to the interchange of equipment (July 10).

E-5509 grants the Dallas Chamber of Commerce leave to intervene in the matter of the application of Braniff Airways for the inclusion of Tulsa, Okla., as an intermediate point on its certificate for route No. 9 (July 10).

E-5510 dismisses complaint filed by Northern Consolidated Airlines with respect to rates proposed by Alaska Airlines (July 11).

E-5511 dismisses proceedings instituted by orders Nos. E-4451 and E-4667 to investigate certain standard fares, charges, routings, and proposed round-trip fares of Trans-Texas between points in Texas (July 11).

E-5512 modifies order No. E-3415, effective Oct. 12, 1949, so as to permit without prior approval of the Board certain acts in performance of, or in the exercise of, rights under an agreement between Northeast Airlines and Consolidated Vultee for the purchase of an aircraft or parts and equipment to be used on the aircraft (July 11).

E-5513 amends paragraph 2 of order No. E-5485, so as to approve until September 30, 1951, or further action of the Board, a certain resolution adopted at Madrid IATA conference between Pan American World Airways, various air carriers, foreign air carriers, and other carriers relating to rates (July 11).

E-5514 authorizes Ozark Airlines to suspend service at Jefferson City, Mo., on segment 6, and at Chanute and Emporia, Kan., on segment 7 of route 107 until airports at said points are adequate for regularly scheduled service with DC-3 aircraft; otherwise denies (July 12).

E-5515 authorizes Wisconsin Central Airlines to suspend service at Land O'Lakes, Wis., until October 1, 1951, on segment 1 of route No. 66 until adequate airport facilities are available for use by it with present equipment; otherwise denies (July 12).

SEPTEMBER 20, 1951

Stall Recovery Program

(Continued from Page 97)

The improved technique, as proved in a series of research tests by the CAA, is to drop the nose of the stalled plane only to the horizon, rather than diving the plane to recover controlled flight. This method of recovery takes longer in point of time, but the airplane loses less altitude, and thus low altitude stalls are less likely to cause accidents.

The project was launched when the detailed investigation of a fatal accident indicated that a student pilot had not received proper instruction in recovery from stalls. The CAA's indoctrination program seeks to make sure that all flight examiners and flight instructors are familiar with the recommended stall recovery technique.

In one Kentucky area, it was found that most flight examiners were wasting about 125 feet of precious altitude in making recoveries from stalls.

Pilots who have flown in the specially equipped plane are sold on the demonstration. "Everyone learning to fly should see this," one pilot remarked. "All pilots should have this experience," another said. "This is of equal value to experienced pilots, as well as students," another said. CAA Safety Agents say the demonstration tends to eliminate the teaching of "pet" stall recovery techniques advocated by some flight instructors.

"Although it is too early in the program to make

CAM Supplements and Aviation Safety Releases

(Issued between August 1, 1951 and August 31, 1951, and obtainable from the CAA Office of Aviation Information, Department of Commerce, Washington 25, D. C.)

Aviation Safety Releases

No.	Date	Subject
349	8/20/51	ANC-23 Bulletin "Sandwich Construction for Aircraft," Part II, dated May 1951.
350	8/24/51	Errors in Reading the Conventional Three-Pointer Altimeter.

CAM Supplements

CAM No.	Supplement No.	Date	Title
24	1	8/1/51	Aeronautical Knowledge.

a positive statement as to its success, the fact that stall-spin accidents show a decline in the regions where the demonstrations have been given and an increase in the other regions would indicate that we are on the right track," said C. F. Horne, Administrator of Civil Aeronautics.

Helpful Publications

Publications listed below are on sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Orders must be accompanied by money order or check made payable to the Superintendent of Documents.

Flight Assistance

Airman's Guide and Flight Information Manual.....\$6 a year

(The Airman's Guide, published every 2 weeks, contains three sections: Directory of Airports, Radio Facility Data, and Notices to Airmen. The Flight Information Manual supplements the Airman's Guide and is issued semiannually.)

Airports

Airport Buildings.....20 cents
(Problems of airport building design are discussed and several solutions suggested.)

Airport Design.....30 cents
(Provides basic information on airport construction.)

Airport Landscape Planting.....15 cents
(Provides practical information on how to improve the appearance of an airport.)

Airport Turfing.....25 cents
(Describes various problems involved and presents methods used in establishing and maintaining a good turf.)

Seaplane Facilities.....25 cents
(Answers problems posed by the planning and construction of seaplane bases.)

Small Airports.....15 cents
(Answers to many problems confronting communities or individuals who want to build a small airport.)

Standard Specifications for Construction of Airports.....\$2.25
(Contains specification items for construction of airports and air parks. Covers clearing and grubbing, grading, drainage, paving, lighting, turfing, and incidental construction.)

Flight Training

Aircraft Powerplant Handbook.....\$1.25
(For students, mechanics, pilots, and engineers who have only superficial knowledge of aircraft powerplant fundamentals.)

Facts of Flight.....50 cents
(A nontechnical manual, with chapters on airplane flight, stalls, spins, airplane structure, airplane engines, flying the plane, airport traffic, seaplanes, and safety in flight.)

Flight Instruction Manual.....\$1.50
(A complete text on flight training for student and instructor. Includes acrobatic maneuvers.)

Path of Flight.....75 cents
(Practical information about basic navigation of aircraft, presented in brief form for the use of the private pilot.)

Questions and Answers for Private Pilots.....15 cents
(A collection of the questions and answers upon which the private pilot written examination is based.)

Realm of Flight.....60 cents
(Presents practical information about the effect of atmospheric conditions upon flight.)

Personal Aircraft Inspection Manual.....55 cents
(Contains information dealing with the fundamentals of inspection and provides a general maintenance guide for the owners of personal type aircraft.)

Miscellaneous

ANC Procedures for the Control of Air Traffic.....40 cents
(Officially approved manual of air traffic control procedures adopted for use by civil and military air traffic control personnel. These procedures are required to be followed by all civil controllers holding certificates under Part 26 of the CAR.)

Personal-Aircraft Owner's Guide.....15 cents
(A collection of the questions most frequently asked by the owners of personal aircraft.)

Student Pilot Guide.....10 cents
(Presents information of particular importance to student pilots during the early stages of flight training.)

Terrain Flying.....25 cents
(Describes the special problems and hazards encountered in flying over various kinds of terrain and proper precautions.)

The Air Fair.....20 cents
(Gives detailed help in planning and operating an air fair.)

Scheduled Air Carrier Operations

(Continued on Page 105)

Domestic: January-June 1951, 1950

Operator	Revenue miles January-June		Revenue passengers January-June		Revenue passenger-miles (000) January-June		Passenger seat-miles (000) January-June	
	1951	1950	1951	1950	1951	1950	1951	1950
Trunk Lines								
American Airlines	33,609,577	27,052,530	2,277,349	1,524,287	1,131,607	760,410	1,467,742	1,162,364
Brant Airways	5,669,304	5,538,855	375,695	301,283	127,803	100,941	198,894	192,363
Capital Airlines	11,870,362	9,609,806	882,847	606,435	277,307	179,052	460,544	346,622
Chicago & Southern Air Lines	3,831,790	3,625,330	206,896	149,854	76,996	53,948	115,590	99,664
Colonial Airlines	1,802,448	1,516,043	110,386	80,741	28,184	21,148	52,275	43,367
Continental Air Lines	3,033,315	2,803,482	123,948	93,466	45,095	32,488	87,371	79,153
Delta Air Lines	8,267,127	7,198,822	427,984	305,567	204,623	139,471	302,157	240,788
Eastern Air Lines	28,931,445	27,157,211	1,759,504	1,247,407	836,712	624,380	1,269,164	1,000,131
Inland Air Lines	1,454,780	1,474,278	48,796	41,353	19,562	15,949	35,358	30,604
Mid-Continent Airlines	4,021,903	4,169,910	184,280	166,081	56,097	48,463	98,619	90,562
National Airlines	7,826,168	5,957,989	324,464	201,325	219,978	129,923	327,558	237,132
Northeast Airlines	2,087,928	1,781,789	199,301	148,162	37,551	27,828	64,092	57,189
Northwest Airlines	5,730,699	10,155,443	299,110	385,225	195,314	235,172	327,841	439,891
Trans World Airlines	24,264,243	21,732,504	991,582	698,663	709,862	480,000	957,594	771,745
United Air Lines	26,075,617	25,730,569	1,271,753	1,087,338	761,168	617,445	1,017,450	969,780
Western Air Lines	4,281,175	3,802,552	300,824	175,722	110,662	66,468	169,027	140,816
Trunk Total	172,757,891	159,307,113	9,784,719	7,212,909	4,838,521	3,533,086	6,951,276	5,902,171
Index (1950=100)	108.44	100.00	135.66	100.00	136.95	100.00	117.77	100.00
Feeder Lines								
All American Airways	1,524,388	1,441,907	91,683	60,297	12,927	8,527	32,012	30,276
Bonanza Air Lines	451,289	444,394	14,288	8,214	3,644	2,034	9,188	8,714
Central Airlines	696,889	870,896	11,156	4,166	1,723	478	11,743	2,613
Empire Air Lines	617,254	534,065	23,766	19,316	4,218	3,786	12,961	11,215
Frontier Airlines	2,188,564	1,560,343	46,414	25,452	12,187	6,954	43,772	29,074
Helicopter Air Service	159,626	160,546	0	0	0	0	0	0
Lake Central Airlines	551,440	369,880	13,299	4,458	2,137	696	11,823	4,343
Los Angeles Airways	179,331	170,502	0	0	0	0	0	0
Mid-Continent Airlines	462,424	732,710	19,360	—	3,896	—	9,711	—
Mid-West Airlines	377,059	—	1,266	3,272	180	478	1,510	2,929
Ozark Air Lines	809,433	—	17,557	—	2,780	—	15,410	—
Piedmont Aviation	1,917,843	1,703,018	83,719	53,290	19,284	10,913	40,276	35,764
Pioneer Air Lines	1,872,079	1,840,090	75,910	58,639	19,709	15,830	44,930	44,267
Robinson Airlines	690,771	582,777	43,548	24,259	6,768	3,813	13,981	10,318
Southern Airways	1,408,947	855,726	41,645	14,312	7,452	2,430	29,537	17,933
Southwest Airlines	1,223,109	1,144,905	68,521	50,738	13,220	9,308	25,696	24,043
Trans-Texas Airways	1,398,588	1,466,954	35,364	26,634	8,412	5,993	29,370	30,804
West Coast Airlines	631,170	603,226	35,125	29,532	5,284	4,192	13,253	12,668
Wiggins, E. W. Airways	306,589	160,735	2,072	1,118	97	97	1,203	638
Wisconsin-Central Airlines	933,264	979,193	37,615	21,391	6,019	3,332	14,296	8,031
Feeder Total	18,400,137	15,571,867	662,308	405,088	130,032	78,861	360,672	273,630
Index (1950=100)	118.16	100.00	163.50	100.00	164.89	100.00	131.81	100.00
Territorial Lines								
Caribbean-Atlantic Airlines	172,078	—	18,741	—	2,274	—	4,818	—
Hawaiian Airlines	305,502	279,997	47,891	37,709	3,789	3,039	8,202	6,945
Trans-Pacific Airlines	1,498,012	1,402,419	157,744	157,229	20,387	20,436	32,172	31,011
Territorial Total	1,975,592	1,682,416	224,376	194,938	26,450	23,475	45,192	37,956
Index (1950=100)	117.43	100.00	115.10	100.00	112.67	100.00	119.06	100.00
Grand Total	193,133,620	176,561,996	10,671,403	7,812,935	4,995,003	3,635,422	7,357,140	6,213,757
Index (1950=100)	109.39	100.00	136.59	100.00	137.40	100.00	118.40	100.00

CAA Transition Program

(Continued from Page 101)

control to maintain the minimum time interval between arriving aircraft. Although the advantages gained by direct communications have long been recognized, the actual need had not been apparent when, on the average, individual approaches required from 10 to 15 minutes to execute.

Today, however, with the inauguration of improved procedures and navigational facilities, the approach interval has been materially reduced. Obviously the volume of communications between controller and pilot must be handled without delay. Communication lags introduced by the relay of clearances through an intermediate party become critical as the time interval between successive landings is reduced.

CAA will establish direct VHF communications between air route traffic controllers and aircraft at specified locations after a study indicates that the direct communications procedure will increase the efficiency of the air traffic control service at that location.

Detailed procedures based on general standards pertaining to the operation of direct communica-

tions have been developed by the CAA and approved by the users of the airways.

CAA's ultimate plans for the 120 low frequency homing facilities, the 290 VHF fan markers, and the low frequency compass locators associated with the instrument landing system, must necessarily be developed gradually and will be based on operational as well as technological considerations. The implementation of the DME program should do much toward providing the service now rendered by the fan marker, and it is logical to assume that the latter will become obsolete after DME is widely available.

LMF homing facilities probably will be required for quite some time but further development of the terminal omnirange may radically change this requirement.

"Tips" on Propeller Visibility

Brightly colored tips on propellers will give them additional visibility, making them appear as rings when revolving. Owner-pilots can help to avoid propeller accidents by having the tips painted red.

Scheduled Air Carrier Operations

(Continued From Page 104)

Domestic: January-June 1951, 1950

Operator	Revenue passenger load factor (percent)		Ton-miles flown					
	January-June		Express January-June		Freight January-June		United States mail January-June	
	1951	1950	1951	1950	1951	1950	1951	1950
Trunk Lines								
American Airlines	77.10	65.42	4,668,973	2,886,503	17,123,925	14,826,265	6,826,731	4,435,287
Braniff Airways	64.26	52.47	571,702	467,347	1,026,562	835,859	780,023	612,750
Capital Airlines	60.21	51.66	1,358,103	1,058,661	2,542,406	3,995,474	933,106	687,291
Chicago & Southern Air Lines	66.61	54.13	377,240	264,961	394,886	403,962	312,619	274,452
Colonial Airlines	53.91	48.77	47,643	36,729	53,273	46,193	52,196	42,900
Continental Air Lines	51.61	41.04	72,536	48,224	287,745	223,558	145,696	97,080
Delta Air Lines	67.72	57.92	614,382	437,438	1,791,875	1,280,578	828,655	571,079
Eastern Air Lines	65.93	62.43	2,847,703	1,882,709	2,594,163	6,446,435	2,812,880	2,413,529
Inland Air Lines	55.33	52.11	48,631	28,923	76,084	69,275	105,205	54,933
Mid-Continent Airlines	56.88	53.51	133,050	110,791	273,762	240,822	205,117	156,567
National Airlines	67.16	54.79	230,325	375,401	2,628,579	1,124,730	531,357	391,629
Northeast Airlines	58.59	48.66	106,154	79,686	127,687	121,650	70,949	53,859
Northwest Airlines	59.58	53.46	982,739	846,147	1,994,695	3,092,064	1,044,734	1,272,147
Trans World Airlines	74.13	62.20	4,228,555	2,577,289	7,685,510	5,736,495	5,711,563	4,114,169
United Air Lines	74.81	63.67	5,326,018	3,779,037	11,674,253	12,488,282	7,682,347	5,474,598
Western Air Lines	65.47	47.20	231,203	238,362	360,732	334,354	629,776	345,046
Trunk Total	69.61	59.86	21,844,957	15,118,208	50,636,137	51,265,996	28,672,954	20,937,316
Index (1950=100)	116.29	100.00	144.49	100.00	98.77	100.00	136.95	100.00
Feeder Lines								
All American Airways	40.38	28.16	76,698	48,953	0	0	25,936	20,050
Bonanza Air Lines	39.66	23.34	1,341	804	7,204	4,829	2,960	2,432
Central Airlines	14.67	18.29	1,068	0	445	0	10,061	7,803
Empire Air Lines	32.54	33.76	9,411	7,431	0	0	12,066	8,848
Frontier Airlines	27.84	23.92	37,078	23,221	139,866	71,864	58,498	27,886
Helicopter Air Service	—	—	0	0	0	0	11,547	9,453
Lake Central Airlines	18.07	16.03	54,809	7,868	0	0	7,245	2,263
Los Angeles Airways	—	—	0	0	0	0	26,048	21,132
Mid-Continent Airlines	40.12	—	23,607	—	19,831	—	10,052	—
Mid-West Airlines	11.92	16.32	0	0	0	0	4,277	8,803
Ozark Air Lines	18.04	—	33,277	—	—	—	7,852	—
Piedmont Aviation	47.88	30.51	48,773	30,982	65,185	53,704	30,207	23,011
Pioneer Air Lines	43.87	35.76	23,711	21,549	79,141	62,525	51,261	47,106
Robinson Airlines	48.41	36.95	31,825	16,432	19,572	15,700	13,024	10,584
Southern Airways	25.23	13.55	39,392	19,188	0	0	43,715	19,864
Southwest Airways	51.45	38.71	24,330	21,599	77,903	65,681	28,669	22,908
Trans-Texas Airways	28.64	19.46	14,345	13,795	30,409	27,115	23,224	25,963
West Coast Airlines	39.87	33.09	5,548	6,077	22,154	2,018	5,767	3,859
Wiggins, E. W., Airways	15.96	15.20	859	0	0	0	718	833
Wisconsin-Central Airlines	42.10	41.49	46,474	20,281	0	0	24,886	16,734
Feeder Total	36.05	28.82	472,546	238,180	455,710	303,439	398,013	279,532
Index (1950=100)	125.09	100.00	198.40	100.00	150.18	100.00	142.39	100.00
Territorial Lines								
Caribbean-Atlantic Airlines	47.20	—	467	—	4,411	—	1,991	—
Hawaiian Airlines	46.20	43.76	0	0	11,355	13,450	4,595	5,229
Trans-Pacific Airlines	63.37	65.90	50,656	60,227	359,525	209,712	20,247	27,618
Territorial Total	58.53	61.85	51,123	60,227	375,291	223,162	26,833	32,847
Index (1950=100)	94.63	100.00	84.88	100.00	168.17	100.00	81.69	100.00
Grand Total	67.89	58.51	22,368,626	15,416,615	51,467,138	51,792,597	29,097,800	21,249,695
Index (1950=100)	116.03	100.00	145.09	100.00	99.37	100.00	136.93	100.00

Civil Aircraft Engine Shipments Show Increase During 1951

A total of 384 civil aircraft engines aggregating 216,100 horsepower valued at \$2,077,000 were shipped during June 1951, according to a report issued jointly by the Civil Aeronautics Administration and the Bureau of the Census, Department of Commerce. Comparable figures for June 1950 show 434 engines, ag-

	June 1951	First 6 months	
		1951	1950
Number, total	362	2,311	2,079
Horsepower (thousands of horsepower)	166.0	1,119.4	867.2
Value of shipments, total (thousands of dollars)	\$7,938	\$46,637	\$32,408
Complete engines	2,077	13,938	10,681
Engine parts	4,855	28,722	20,556
All other products	1,066	3,977	1,171

gregating 173,800 horsepower, valued at \$2,015,000. In comparison with shipments made from January through June 1950, cumulative totals for the same period in 1951 show an 11 percent increase in num-

ber and a 29 percent increase in horsepower. Total value of all shipments from plants producing complete aircraft engines (exclusive of shipments to U.S. military customers) increased 44 percent over the same period of 1950.

Employment of 66,503 persons in aircraft engine plants in June 1951 represents an increase of 60 percent over the 41,425 employed in the same month of 1950.

Personal-Aircraft Owner's Guide Issued

A booklet, "Personal-Aircraft Owner's Guide," providing answers to questions of interest to personal aircraft owners has been issued by the Civil Aeronautics Administration.

The 18-page publication gives information concerning the operation and ownership of personal aircraft and is based on questions owners most frequently ask the CAA's Office of Aviation Safety. The CAA believes it will be of special interest to new owners and those planning to sell a plane.

The booklet is on sale for 15 cents by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Civil Aviation Highlights

	1951	1950
Airports and airfields recorded with CAA, August 1	6,245	6,412
By type:		
Commercial	2,127	2,410
Municipal	2,290	2,233
CAA Intermediate	65	111
Military	380	331
All Others	1,433	1,327
a. Personal use	1,284	1,185
b. Miscellaneous government	149	142
Civil airports and airfields by class		
Total	5,915	6,081
Class I and under	3,862	4,015
Class II	954	977
Class III	504	500
Class IV	379	371
Class V	135	136
Class VI and over	81	82
Total U. S. civil aircraft, August 1	90,380	92,570
Scheduled air carrier aircraft, August 1	1,215	1,163
Civil aircraft production, June		
Total	216	369
1- and 2-place models	50	107
3-, 4-, and 5-place models	153	251
Over 5-place models	13	11
Certificates approved, June		
Student pilots	4,994	4,699
Private pilots	2,331	2,776
Commercial pilots	604	484
Airline transport pilots	120	61
Mechanics (original certificates)	412	639
Ground instructors (original certificates)	30	74
Flight instructor ratings	158	152
Instrument ratings	283	86
Control tower operators	123	50
Traffic control activity, June		
Aircraft operations, CAA airport towers	1,553,913	1,507,110
Fix postings, CAA airport towers	1,136,528	896,224
Instrument approaches, CAA approach control towers	25,172	15,984
AIRPORT OPERATIONS		
Washington National, July		
Scheduled air carrier:		
Passengers departing	111,206	70,748
Passengers arriving	108,815	71,234
Aircraft arrivals and departures	13,417	10,481
Other aircraft arrivals and departures	4,545	2,986
San Francisco Municipal, June		
Scheduled air carrier:		
Passengers departing	59,712	59,571
Passengers arriving	59,875	58,606
Aircraft arrivals and departures	7,896	6,667
Other aircraft arrivals and departures	3,568	3,429
Oakland Municipal, June		
Scheduled air carrier:		
Passengers departing	9,559	7,794
Passengers arriving	9,221	7,339
Aircraft arrivals and departures	4,799	3,920
Other aircraft arrivals and departures	12,153	11,827
Miami International, June		
Scheduled air carrier:		
Passengers departing	59,393	(¹)
Passengers arriving	56,991	(¹)
Aircraft arrivals and departures	7,513	7,750
Other aircraft arrivals and departures	10,218	6,592
Los Angeles International, June		
Scheduled air carrier:		
Passengers departing	74,153	64,561
Passengers arriving	75,293	62,964
Aircraft arrivals and departures	8,520	8,743
Other aircraft arrivals and departures	7,571	5,438

¹ Airport type definitions: Commercial—Public use and public services, private control. Municipal—Public use and public services, public control. CAA Intermediate—No public services, CAA control. Military—No public services, military control. Other—(a) No public services, private control (b) No public services, Federal Government control (Forest Service, etc.)

² The following is a breakdown of paved airports and unpaved airfields by class:

Class of Facility	Paved airports	Unpaved airfields	Totals
Class I and under	115	3,747	3,862
Class II	171	783	954
Class III	343	161	504
Class IV	337	42	379
Class V	129	6	135
Class VI and over	80	1	81
Totals	1,175	4,740	5,915

³ Not available.

Air Regulations and Manuals September 1, 1951

TITLE	NO.	Civil Air Regulations				Civil Aeronautics Manuals			
		Price	Date	Amend-ments	Special Regulations	Price	Date	Supple-ments	Amending Releases
AIRCRAFT									
Certification, Identification, and Marking of Aircraft and Related Products	1	\$0.05	1/15/51						
Production Certificates	02					\$0.10	8/ 1/46		
Airplane Airworthiness; Normal, Utility, Aerobatic, and Restricted Purpose Categories	3	.15	11/ 1/49	6	358, 360			7	
Airplane Airworthiness	04					.75	7/ 1/44		193, 202
Airplane Airworthiness	4a	.20	4/ 7/50		358, 360				
Airplane Airworthiness; Transport Categories	4b	.25	7/20/50	3	358, 360, 361, 370			6	
Rotorcraft Airworthiness	6	.10	1/15/51		358, 360			1	
Aircraft Airworthiness; Restricted Category	8	.05	10/11/50			.60	1/ 1/51	1	
Aircraft Airworthiness; Limited Category	9	.05	11/11/49	1					
Aircraft Engine Airworthiness	13	.05	8/ 1/49	2	358				
Aircraft Propeller Airworthiness	14	.05	11/ 1/49	2	358	.15	5/ 1/46		
Aircraft Equipment Airworthiness	15	.05	11/ 1/49	3	358, 360				
Aircraft Radio Equipment Airworthiness	16	.05	2/13/41			Free	2/13/41		62, 272
Maintenance, Repair, and Alteration of Certified Aircraft and of Aircraft Engines, Propellers, and Instruments	18	.05	8/15/49			1.25	8/ 1/49	1	
AIRMEN									
Pilot Certificates	20	.05	8/ 1/49	9	371			1	
Airline Transport Pilot Rating	21	.05	8/15/49	3	371				
Lighter-than-air Pilot Certificates	22	.05	11/ 1/49	6					
Mechanic Certificates	24	.05	9/ 1/49	5	365, 371				
Parachute Rigger Certificates	25	.05	9/ 5/50	1					
Air-traffic Control-tower Operator Certificates	26	.05	11/ 1/49	4				3	
Aircraft Dispatcher Certificates	27	.05	11/ 1/49	4	371			2	
Physical Standards for Airmen	29	.05	10/ 1/49	2					
Flight Radio Operator Certificates	33	.05	2/15/50	5	371			3	
Flight Navigator Certificates	34	.05	11/ 1/49	4	371			2	
Flight Engineer Certificates	35	.05	11/ 1/49	4	371			2	
OPERATION RULES									
Air Carrier Operating Certification	40	.05	9/ 1/49		356, 363, 366, 367, 369			3	
Certification and Operation Rules for Scheduled Air Carrier Operations Outside the Continental Limits of the United States	41	.05	11/15/49	3	356, 360, 367			11	
Irregular Air Carrier and Off-Route Rules	42	.10	6/ 1/49	9	337, 360, 367, 368	1.00	9/ 1/49	3	
General Operation Rules	43	.05	8/ 1/49	7	360			2	
Foreign Air Carrier Regulations	44	.05	9/ 1/49						
Commercial Operator Certification and Operation Rules	45	.05	11/15/49	1	337, 356, 367				
Operation of Moored Balloons	48	.05	9/ 1/49						
Transportation of Explosives and Other Dangerous Articles	49	.10	7/20/49						
AIR AGENCIES									
Airman Agency Certificates	50	.05	10/ 1/49	3	354, 355	.15	5/15/46	3	254
Ground Instructor Rating	51	.05	10/10/49	2		Free	6/ 8/51	1	
Repair Station Rating	52	.05	10/15/49						
Mechanic School Rating	53	.05	10/15/49			Free	5/—/40	1	
Parachute Loft Certificates and Ratings	54	.05	10/15/49	1		.15	7/ 1/48		
AIR NAVIGATION									
Air Traffic Rules	60	.10	8/ 1/49					5	
Scheduled Air Carrier Rules	61	.10	9/ 1/49	4	356, 360, 363, 366, 367, 368			8	
Notice and Reports of Aircraft Accidents and Missing Aircraft	62	.05	5/ 1/49						

NOTE: Items for which a price is listed may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Remittances should be made by check or money order payable to the Superintendent. Amendments and Special Regulations may be obtained from the Publications Section, Civil Aeronautics Board, Washington 25, D.C. Free Manuals, Supplements and Releases are available from the Office of Aviation Information, Civil Aeronautics Administration, Washington 25, D.C.

¹ Pending publication of a complete Manual, supplements containing rules, policies, and interpretations of the CAR's will be issued in the form of pages for a Manual and will be available free of charge until release of the Manual.

² Certain aircraft may comply with the provisions of this Part or Part 4a.

³ Supplements to the new Manual should be used in conjunction with this Manual, the major portions of which are still applicable to agency certificate requirements.

CAB Order Denies Merger Of West Coast, Southwest

The Civil Aeronautics Board last month denied the proposed merger of West Coast Airlines into Southwest Airways Company. The two airlines, West Coast and Southwest are local air carriers operating along the Pacific Coast under temporary certificates of public convenience and necessity.

The Board said that it had actively encouraged certificated air carriers to take appropriate steps voluntarily for the improvement of the air route pattern, but added that important considerations of public interest in the present instance "impel us to the conclusion that those proposals [the West Coast-Southwest Merger] will result in an undesirable change in the air route pattern."

The Board felt that two distinct trade areas were involved in the proposed merger—the Seattle-Portland area serving the northern part of the coast and operated by West Coast, and the Los Angeles-San Francisco area serving the southern part and operated by Southwest. The Board said that it had originally granted authorization for the carriers to operate in their separate areas in accordance with its policy to authorize operations by local companies whose interests are centered in the area to be served. In the

present instance, the proposed merger, the Board said, will result in tying together for service by one local carrier two trade areas which are not essentially related to each other.

Civil Aircraft Shipments Drop During 1951 Six-Month Period

Civil aircraft shipments during June 1951 totaled 216 aircraft, weighed 435,700 airframe pounds, and was valued at \$8,080,000 according to a report issued jointly by the Civil Aeronautics Administration and the Bureau of the Census, Department of Commerce. Comparable figures for June 1950 were 369 aircraft, weighing 545,500 airframe pounds, valued at \$9,381,000.

Cumulative totals for January through June show an 18 percent decrease in number and a 9 percent decrease in airframe weight from shipments made during the same period in 1950. However, total value of all shipments from plants producing complete aircraft (exclusive of shipments to U. S. military customers) increased 5 percent over the same period of 1950 as a result of advances in the

dollar value of aircraft parts and all other products.

Employment in plants manufacturing complete aircraft in June 1951 totaled 298,128, a gain of 79 percent over the 166,787 employed in the same month a year ago. Unfilled orders for aircraft weighing 3,000 pounds airframe weight and over, numbered 576 in June 1951 compared to 157 for June 1950.

Civil Aircraft Shipments

	June 1951	First 6 months	
		1951	1950
Number, total	216	1,477	1,793
Number by type of plane:			
Personal	203	1,406	1,746
Transport	13	71	47
Number by place:			
1- and 2-place	50	375	527
3- to 5-place	153	1,031	1,219
Over 5-place	13	71	47
Airframe weight (thousands of pounds)	435.7	2,626.2	2,885.8
Personal	168.7	1,186.1	1,333.1
Transport	267.0	1,440.1	1,552.7
Value of shipments, total (thousands of dollars)	\$15,518	\$80,127	\$76,351
Complete aircraft	8,080	44,052	49,325
Aircraft parts	3,720	17,396	15,439
All other products	3,708	18,739	11,587
Unfilled orders (number of aircraft 3,000 pounds airframe weight and over)	576		

Agricultural Flying— Major Aviation Activity

(Continued from Page 97)

Mr. Horne said that other avenues of experiment mentioned by Mr. Salter, "all of which suggest additional areas in which the airplane would be useful," include the development of chemicals which are applied at blossom time to thin out the crop, thus producing more and better apples; and chemicals, now available, which hasten the ripening of certain fruits, prevent fruit from dropping from the trees too early, stagger the maturing of the pineapple crop to facilitate picking and shipping, make the buttons stick on lemons during marketing, and reduce leaf shade in tomato crops and thus hasten ripening.

"With the revolutionary advances in chemicals for agriculture," the Administrator said, "it was a logical next step to develop an airplane that would make possible more efficient application of these chemicals to large areas. The surplus planes of World War II have been a fortunate heritage, but your organization was among the first to recognize that something more was needed to meet the special requirements of agricultural flying.

Plane for Farming.—"Acting on the suggestions we received from your group and others interested, we contracted with the Personal Aircraft Research Center of the Texas A. & M. College system to design and build one experimental plane especially suited to agricultural use. CAA personnel worked closely with the contractor, and generous donations from industry sources also helped make the finished product possible.

"This plane is not yet in production, and the CAA, of course, will not build it," Mr. Horne continued. "What we have here is a prototype which is being tested under all conditions so that when we finally turn over the detailed plans and specifications to any manufacturer who wants to build and sell it, all of the 'bugs' will be eliminated. This is more than a plane especially designed for dusting and spraying. We had in the back of our minds while designing it, the possibility of using it for general farm flying. With slight conversions this plane can be made into an excellent plane of all work around a farm. The duster bin, for example, contains 27 cubic feet, and that space can easily be made into a very convenient cargo space. It would carry a side of beef, several bushels of seed, grain or fruit, emergency farm equipment parts, all the flying jobs needed in operation of a big farm."

Omnirange.—Mr. Horne then extended his remarks to include the use of the omnirange. "First," he said, "the omnirange is more reliable than the low-frequency, four-course range, since it eliminates quadrant confusion, and to a large extent, static problems. But, like any other electronic device, it has its own peculiarities.

"In the beginning we used a square, wooden housing for the antenna, and we found that the dead air spaces in the corners of the building affected the signals. Therefore, we converted to the cylindrical, plastic housing for the antenna with which you probably are familiar. These housings absorb no moisture as the wooden structures did, and of course, they have no corners. This change has greatly improved the stability and clarity of the courses.

"Omni signals being, as you know, 'line-of-sight,' often are not receivable at very low altitudes," Mr. Horne continued. "Some have noted this peculiarity as a criticism of the omni. It is equally true, however, that the omnirange is a radio aid for flying in instrument weather, and there is little reason, we maintain, for a pilot to be down so low either in instrument or visual flight as to be below the effective area of VOR signals. It would be unwise to fly that low in instrument weather, and completely un-

Number of Airports in U. S. Shows Slight Decrease

The total number of civil and military airports in the United States on record with the Civil Aeronautics Administration showed a decrease during the first six months of 1951. As of July 1, 1951 there were 6,276 airports as compared to 6,449 a year ago.

The larger airports—the municipal type airports and Class IV and over—continue to show a steady increase. Municipal airports now total 2,287, an

increase of 57, and there are 793 Class IV or larger airports as compared with last year's 783.

Texas still leads the country with a total of 618; California is second with 513; and Michigan with 250, three more than New York's total, is third.

The State-by-State distribution of airports by type and class as of July 1, 1951, is shown below:

U. S. Airports and Airfields by States, July 1, 1951

(Data covers existing airports recorded with CAA)

State	Total	By Type ¹					By Class					
		Municipal	Commercial	CAA Intermediate	Military	All Other	Sub I and I ²	II	III	IV	V	VI and over
Alabama.....	86	36	24	0	16	10	42	16	14	10	2	2
Arizona.....	175	44	26	1	25	79	71	43	31	15	14	1
Arkansas.....	85	32	23	0	0	25	55	11	10	9	0	0
California.....	513	163	154	5	43	148	288	80	51	37	33	24
Colorado.....	103	54	23	2	2	17	50	27	19	1	0	6
Connecticut.....	27	9	14	0	0	4	18	1	3	4	1	0
Delaware.....	17	2	9	0	1	5	10	4	0	1	0	2
District of Columbia.....	3	1	0	0	2	0	0	0	0	1	1	1
Florida.....	182	88	39	2	47	6	47	26	38	41	11	19
Georgia.....	119	54	14	1	11	39	49	19	22	22	2	5
Idaho.....	144	71	13	1	1	58	118	14	7	2	0	3
Illinois.....	174	40	108	1	4	21	106	44	11	9	4	0
Indiana.....	147	36	97	0	4	10	98	29	10	8	2	0
Iowa.....	166	57	43	1	2	63	137	15	5	8	0	1
Kansas.....	186	99	41	0	8	38	124	26	14	5	9	8
Kentucky.....	59	14	25	0	2	18	46	3	5	4	0	1
Louisiana.....	83	34	15	0	4	30	46	13	11	8	2	3
Maine.....	63	26	20	0	3	14	38	6	12	2	2	3
Maryland.....	50	7	24	0	6	13	23	13	4	6	0	4
Massachusetts.....	75	23	44	0	5	3	45	10	10	7	0	3
Michigan.....	250	122	87	0	5	36	176	44	14	12	1	3
Minnesota.....	123	82	38	0	1	2	77	34	6	4	1	1
Mississippi.....	84	33	25	1	6	19	46	12	16	8	1	1
Missouri.....	105	48	43	1	1	12	71	16	10	5	3	0
Montana.....	115	78	15	1	1	20	84	13	6	6	2	4
Nebraska.....	136	71	34	2	1	28	102	14	5	2	2	11
Nevada.....	76	18	17	6	4	31	39	6	12	9	9	1
New Hampshire.....	34	12	16	0	1	5	24	4	3	2	0	1
New Jersey.....	81	7	65	0	5	4	55	11	9	4	1	1
New Mexico.....	93	29	19	8	5	32	47	15	7	10	7	7
New York.....	247	49	116	1	7	74	182	30	12	16	5	2
North Carolina.....	140	36	73	0	11	20	86	19	18	11	2	4
North Dakota.....	136	62	49	5	0	30	111	14	3	8	0	0
Ohio.....	231	42	149	2	4	34	169	40	8	10	2	2
Oklahoma.....	147	82	35	1	5	24	89	23	12	13	7	3
Oregon.....	117	43	30	2	0	42	78	9	11	14	4	1
Pennsylvania.....	213	46	148	1	5	13	164	27	13	8	1	0
Rhode Island.....	10	3	5	0	2	0	5	1	1	1	2	0
South Carolina.....	62	36	15	1	5	5	26	13	3	11	6	3
South Dakota.....	72	48	16	1	1	6	50	9	6	3	2	2
Tennessee.....	68	23	26	1	2	11	39	13	3	5	3	0
Texas.....	618	169	128	3	40	278	369	114	50	48	26	11
Utah.....	59	37	8	6	3	5	24	13	13	3	5	1
Vermont.....	21	10	10	0	1	0	17	0	3	1	0	0
Virginia.....	133	27	67	2	14	23	89	20	9	11	2	2
Washington.....	176	71	49	1	11	44	111	25	11	17	5	7
West Virginia.....	56	14	26	2	0	14	42	8	2	3	1	0
Wisconsin.....	167	65	84	2	1	15	116	32	14	3	1	1
Wyoming.....	54	34	11	2	0	7	26	9	13	4	1	1
GRAND TOTAL.....	6,276	2,287	2,160	66	328	1,435	3,925	988	570	452	185	156

¹ Airport type definitions: Commercial—Public use and public services, private control. Municipal—Public use and public services, public control. CAA Intermediate—No public services, CAA control. Military—No public services, military control. Other—(a) No public services, private control (b) No public services, Federal Government control (Forest Service, etc.)

² Sub I airports are those which do not come up to Class I standards.

necessary in VFR weather. The signals are there, and it is no problem for the pilot to fly his plane at an altitude where they can be properly received. As a matter of fact, if he is too low on VFR to receive the signals, he can fly by reference to the ground, knowing that up above him, a relatively few feet, the electronic aid is available whenever he wants it.

"If you will keep in mind just what the omnirange is and does," he said, "and remember that we plan to continue a limited network of low-frequency ranges to do other necessary jobs, you will find the omnirange a wonderful help in extending the scope and ease of your flying."

Accident Prevention.—The Administrator concluded his remarks with comments on CAA's promotion of "hangar flying" meetings, organized by private pilot groups to discuss the cause and cure of private pilot accidents.

"The CAB is cooperating with us in this campaign," he said, "because their figures on accidents in private flying reveal that carelessness or show-off flying causes many accidents. Our studies also indicate that there

are several classifications of accidents which can be attributed to the pilot himself, and we believe the pilot himself can prevent them."

"I hope you will discuss the matter with your CAA Safety Agent when you get home, who is eager to cooperate in putting on such a self-education, accident prevention meeting."

Sunburned Airplanes

A shiny surface on a fabric covered airplane is similar to a coat of high-grade lacquer. It will last for several years if protected from abrasion and from sunlight. Summer sun with its high content of ultra-violet light will cause the dope to crack and become powdery.

The best protection for a doped or lacquered surface is a good coat of wax similar to that used to protect automobile finishes. For best results, apply the wax with a soft rag.

Before waxing, the fabric should be washed with a mild soap and warm water, then rinsed. It's a good idea to check the drain holes during the wash to see that they have not been closed by dirt or dope.

Discussion Meetings To Promote Safety Suggested by CAA

"The private pilot can do more for flying safety than all the rules and regulations in the book," Charles F. Horne, Administrator of Civil Aeronautics, said in calling for hundreds of "self-education" discussion meetings of private pilots.

He was joined in his recommendation of this method of safety education by Donald W. Nyrop, Chairman of the Civil Aeronautics Board, who said that he anticipates "real improvement" in safety records if private pilots will educate themselves in safe flying.

The CAA has issued a special guide for these discussion meetings, based upon two reports of accidents caused by pilot error. The first, "The Human Equation in Aircraft Accidents" was issued by the CAB, and the second, "Accident Causes Attributed to Private Pilots" by the CAA. Each is a study of accidents to private pilots which, in the words of Mr. Horne, "would have been avoided if the pilot had been better educated in safe flying."

"We would like to see hundreds of these discussion meetings held by private pilots all over the country," the Administrator and Chairman said in releasing the guide. "The plan is simple, and as strictly American as hangar-flying. In fact, this is hangar-flying with a purpose. In these meetings, private pilots can learn to fly right and live to fly."

Flying clubs, flying farmers, chapters of the Ninety Nines, groups of ex-Wasps, or the pilots who operate from a given field are groups which could profitably use the CAA's outline for such discussion meetings. The CAA proposes that pilots or airport managers originate and stage the meetings and that they follow the discussion method rather than invite a lecturer in to tell them about safe flying practices. Aviation Safety Agents of the CAA and representatives of the CAB in the field will be available to assist in staging the meetings.

Copies of the outline, which include practical suggestions known to be effective for conducting a successful panel discussion are available at CAA District and Regional Offices, and the two reports, plus a number of other CAA and CAB publications on various aspects of flying safety, are available free or at low cost from Washington.

Chairman Nyrop said, in discussing CAB's part in the education program, "We are convinced that self-education in safety by the pilots will result in real improvement in our safety figures."

Mr. Horne foresees wider acceptance of the airplane as a personal vehicle when its safety record is improved.

"That record improves over the years," he said, "but further improvement certainly will influence many who contemplate becoming personal aircraft owners. The private pilot himself can do more for flying safety than all the rules and regulations in the book."

Aliens Airmen Certificates to Expire

Aliens who hold airmen certificates issued by the Civil Aeronautics Administration were warned last month by the CAA that these certificates expire September 26, 1951.

It is estimated that between 600 and 700 aliens, holding pilot, ground and flight crew certificates, are affected. CAA Aviation Safety Agents should be contacted regarding renewals. Generally, no further tests or examinations are necessary.

Aliens who hold limited U. S. pilot certificates, based on licenses held from foreign countries, must show that their foreign certificate is valid and must have a current medical certificate.

Dusting Data Obtained In Survey of Operators

Important new data concerning pilot employment in crop dusting and spraying has been obtained from a survey conducted by the National Aviation Trades Association and analyzed by the Civil Aeronautics Administration.

The analysis shows that:

(1) More than 6,400 pilots do dusting and spraying—almost as many pilots as are employed by the airlines. (The airlines employed 7,250 in 1950.)

(2) For this difficult type of flying, 1,000 hours of previous pilot experience is required, and operators say that it takes a season and a half to train a pilot who has this prerequisite.

(3) More than 60 percent of the pilots having such skill are subject to military call as reservists or under the draft.

Commenting on this percentage, Charles F. Horne, Administrator of Civil Aeronautics, recently told the National Flying Farmers Association that "possible call to military service of large numbers of crop dusting and spraying pilots" is "perhaps the chief hazard to the continuation and growth of agricultural flying."

The survey showed that 40 percent of the pilots employed in dusting and spraying are subject to call as reservists, and 21 percent under the draft.

These statistics were compiled by the CAA on the basis of replies to questionnaire sent to dusting and spraying operators by the NATA. The Association mailed 1,300 questionnaires and received 390 replies. CAA projected the results of this wide sampling to the 1,700 concerns which received dusting and spraying waivers from CAA last year.

On this basis, CAA estimated that the 1,700 concerns employ 6,486 pilots.

CAA Substantial Purchaser In Electronic Supply Field

The Civil Aeronautics Administration is a substantial purchaser of equipment in the electrical and electronic fields, a survey of Fiscal Year 1951 purchases reveals.

Contracts for the year total about \$15,000,000, of which some \$5,600,000 went to major manufacturers and \$9,400,000 to small business firms.

The purchases covered a wide variety of materials, ranging from engine generators, cable, radio receivers and transmitters to such complex equipment as radar and Distance Measuring Equipment ground installations. In addition, the CAA regional offices often let contracts for erection of buildings, grading, etc., in connection with installation of air navigation facilities. Most of the latter jobs have been handled by small contractors with limited equipment and a few construction workers.

The CAA construction and maintenance of the Federal Airways is an important part of the defense effort, and contractors supplying the CAA are accorded priorities in obtaining materials which are equal to those offered on military contracts.

Persons interested in supplying defense needs should write to the Procurement Branch, Office of General Services, CAA, Washington 25, D. C., explaining what type of equipment they can produce. Their names then will be added to the prospective bidder list, and they will be sent invitations to bid on CAA needs in their fields.

"Air Fair" Still Available

The "Air Fair" contains detailed suggestions for use in planning and operating an "air fair." Material was drawn from previous experiences connected with successful air fairs and relates to sponsorship, financ-

Aviation Mobilization Basis of Program Suggested to States

A suggested uniform State Plan for Civil Aviation Mobilization and Civil Defense has been issued by Charles F. Horne, Administrator of Civil Aeronautics.

The Plan has been evolved by the combined efforts of the Aviation Development Advisory Committee of the CAA and the Emergency Aviation Council, the latter a conference of 13 aviation organizations. It has been approved by the CAA and the Federal Civil Defense Administration and now is offered for consideration by those states which as yet have not organized their local civil aviation activities for service in emergencies. It is available also for study by the 28 states which already have such organizations in being.

Copies of the Plan have been sent to all Governors, who have referred the Plan to their state departments of aviation and state civil defense agencies for action.

The uniform Plan recommends that the state director of aviation be set at the head of the emergency mobilization effort, and that an Aviation Advisory Council be appointed to work with him. His duty will be to "coordinate all plans with and be responsible to the state Civil Defense Director of Transportation for the organization, assembly and direction of civil aircraft participating in civil defense missions."

Serving with the State Chief of Aviation will be Area or Section Chiefs, below them County Chiefs, and below them Local Chiefs who will probably be airport managers and thus closely associated with airmen, airport and aircraft operators. The Area, County and Local Chiefs, according to the Plan, each will have advisory councils of citizens to assist them. The duties of these Chiefs are spelled out in the suggested Plan.

Three conditions are assumed under which this civilian aviation organization would go into action. They are: military emergency not declared but anticipated; military emergency declared; and active war. The Plan lists detailed planning action for the guidance of officials under each of these conditions.

"The advantage of adopting a uniform State Plan is obvious enough," Horne said in announcing completion of the Plan. "We want to be certain, also, through advance planning, that all of the valuable services of the civil pilot and his aircraft will be available for use in emergency. Our studies have shown that civil aircraft and airmen can play important roles in emergency situations; and we have been cooperating closely with the military and civil defense authorities in devising plans for the use of civil aircraft in essential operations and in emergency situations."

The Plan proposes ten annexes, on such subjects as Airman Registration, Aircraft Registration, Responsibilities of the Manager of a Control Airport, Communications, Disaster Agencies, and Security Control of Air Traffic, for adoption by the various state organizations.

The uniform Plan suggests that CAA's communications system, as the most extensive aeronautical communications system in operation, be used as the primary means of disseminating the initial alert messages to control airports. The Regional Offices of the CAA will work alongside the State Aeronautics Commission, the Air Force and the "Disaster Agencies" in top direction of the mobilization Plan.

Below these top offices, the manager of a "Master Control Airport" channels plans and instructions down to local personnel at airports and landing areas. Annexes are included which detail the responsibilities of the various officials.

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